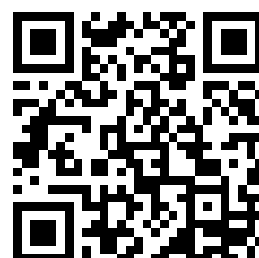

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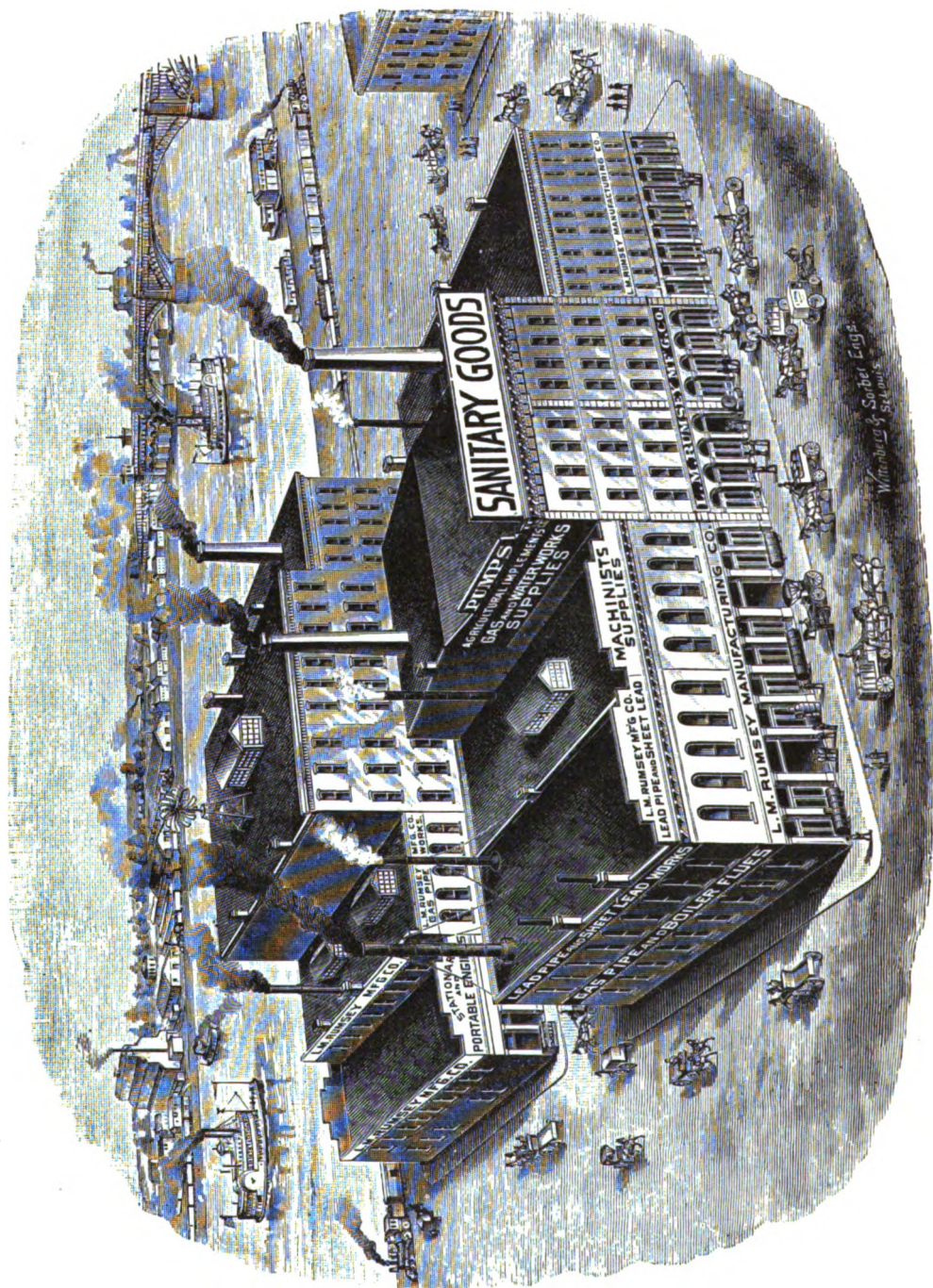
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FACTORY AND WAREHOUSES OF THE L. M. RUMSEY MANUFACTURING COMPANY.
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No. 97.



L. M. RUMSEY MFG. CO.

ST. LOUIS, MO., U. S. A.,

MANUFACTURERS AND JOBBERS OF

Railway, Foundry, Steam

.....AND.....

Gas Fitters', Miners' AND Water Works

SUPPLIES,

Iron and Wood Working Machinery,

Engines and Boilers, Shafting and Pulleys,

Pump and Hoisting Machinery,

Belting, Hose, Packing, Etc., Etc.

....1897....



IN compiling this catalogue we have endeavored to show, in a clear and comprehensive manner, a full and complete line of BRASS STEAM GOODS, RAILWAY, FOUNDRY, MINERS' AND WATER WORKS SUPPLIES, IRON AND WOOD-WORKING MACHINERY, ENGINES AND BOILERS, SHAFTING AND PULLEYS, PUMPS AND HOISTING MACHINERY, BELTING, HOSE, PACKING, ETC., ETC.

The list prices throughout were prepared with much care, and are correct up to date; however, all prices, whether list, net or discounts, are subject to change without notice, but will at all times be as low as the market will afford.

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Yours faithfully,

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BRASS GOODS

FOR ENGINE AND BOILER FITTING, STEAM AND
GAS FITTERS.

AIR COCKS, STEAM METAL.

No. 1.

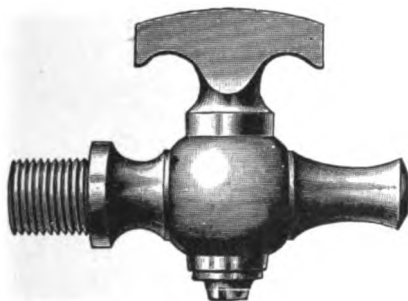


Plate 1.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Finished, each	\$0 40	40	50	60

No. 12.

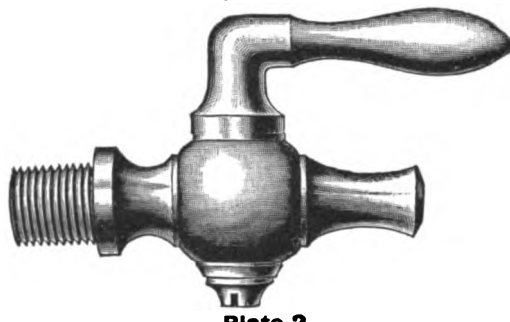


Plate 2.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Finished, each	\$0 55	55	65	75

No. 14.

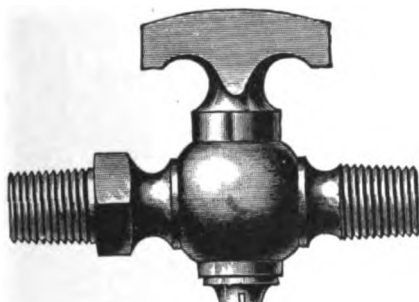


Plate 3.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Finished, each	\$0 55	55	65	90

No. 26.

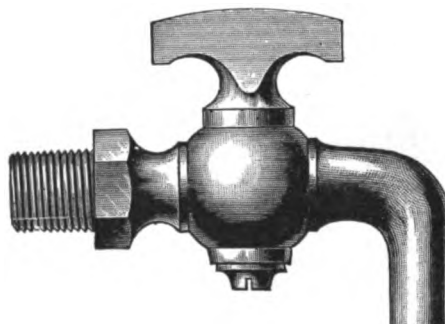


Plate 4.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
Finished, each	\$0 70	70	80

No. 29.

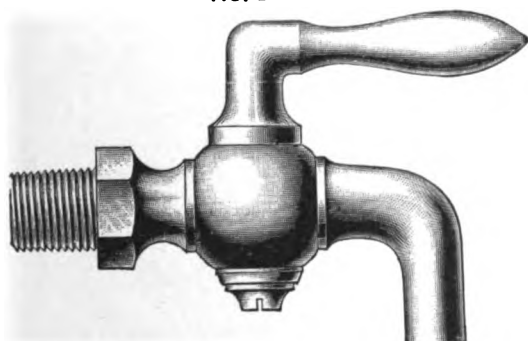


Plate 5.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Finished, each	\$0 80	80	90	1 00

No. 37.

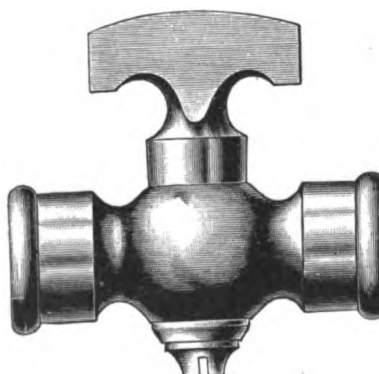
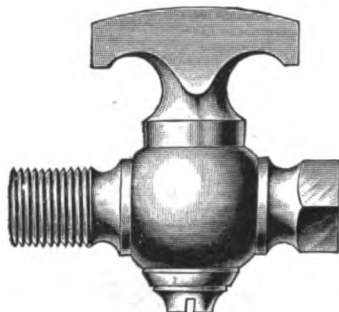
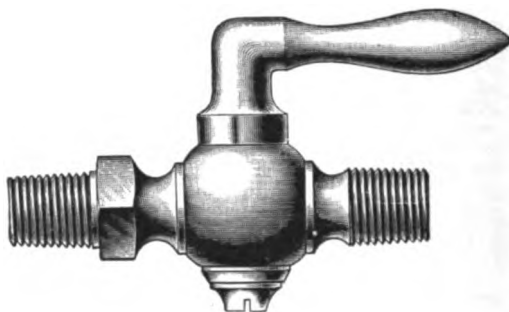


Plate 6.

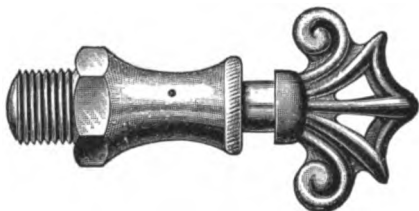
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Finished, each	\$0 80	1 00	1 10	1 35

AIR COCKS, STEAM METAL.**No. 43.****Plate 7.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
Finished, each	\$0 75	85	95

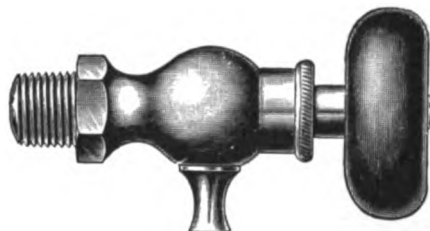
No. 22.**Plate 8.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Finished, each	\$0 60	70	85	1 00

COMPRESSION RADIATOR AIR VALVES.**No. 1.****Plate 9.**

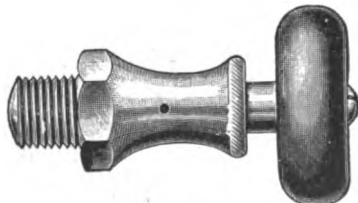
Threaded for Iron Pipe.

	Plain.		Nickel-plated.	
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$
Price, each	\$0 30	35	35	40

No. 3.**Plate 10.**

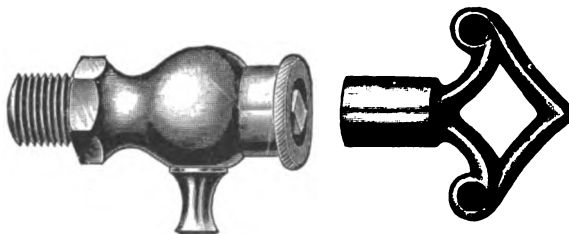
Threaded for Iron Pipe.

	Plain.		Nickel-plated.	
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$
Price, each	\$0 65	70	70	75

No. 2.**Plate 11.**

Threaded for Iron Pipe.

	Plain.		Nickel-plated.	
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$
Price, each	\$0 40	50	45	55

No. 4.**Plate 12.**

Threaded for Iron Pipe.

	Plain.		Nickel-plated.	
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$
Price, each	\$0 55	60	60	65
One Key to each doz. Extra Keys 6 cents each, net.				

AUTOMATIC RADIATOR AIR VALVES.

PERFECTED DUPLEX NO. 1 FOR STEAM.



Plate 13.

Price, each \$1 15

DUPLEX FOR HOT WATER.

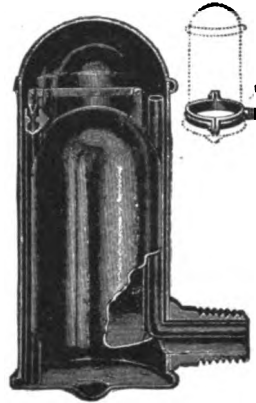


Plate 14.

Price, each \$3 00

NO. 3 ACME AUTOMATIC AIR VALVE,
FOR DIRECT RADIATORS.



Plate 15.

Price, each \$1 15

MONASH STEAM AIR VALVE, No. 1.

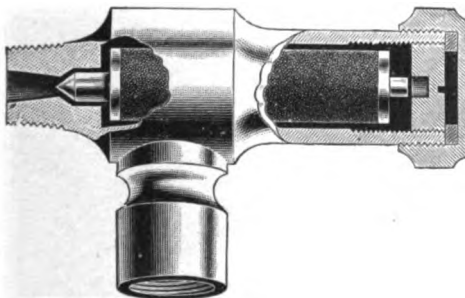


Plate 16.

Finished and Nickel-plated, per doz . . . \$7 50
Drip Cups, per doz 2 00
R. & L. Couplings with Union, per doz . . 3 50

JENKINS' AUTOMATIC AIR VALVES.

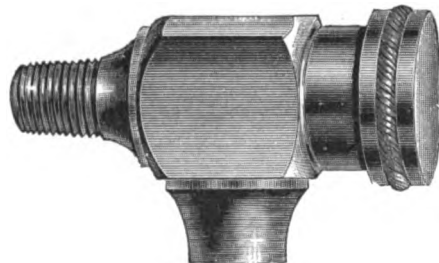
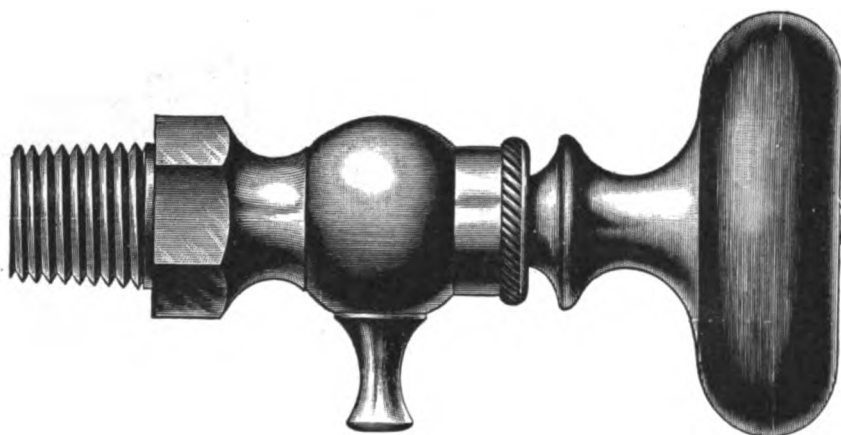
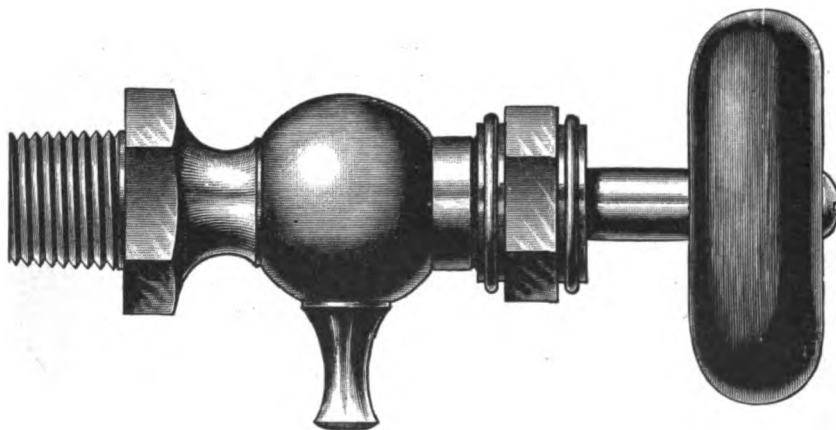


Plate 17.

Finished or Nickel-plated, per doz . . . \$7 50
Drip Cups, per doz 2 00
Right and Left Couplings, per doz . . . 2 50

COMPRESSION GAUGE COCKS.**No. 2.****Plate 18.**

Pipe size, threaded	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$ in.
Finished, each	\$1 10	1 20	1 35

WITH STUFFING BOX.**No. 4.****Plate 19.**

Pipe size, threaded	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$ in.
Each	\$1 35	1 50	1 70

COMPRESSION GAUGE COCKS.

PATENT WOOD HANDLE, WITH STUFFING BOX.

No. 5.

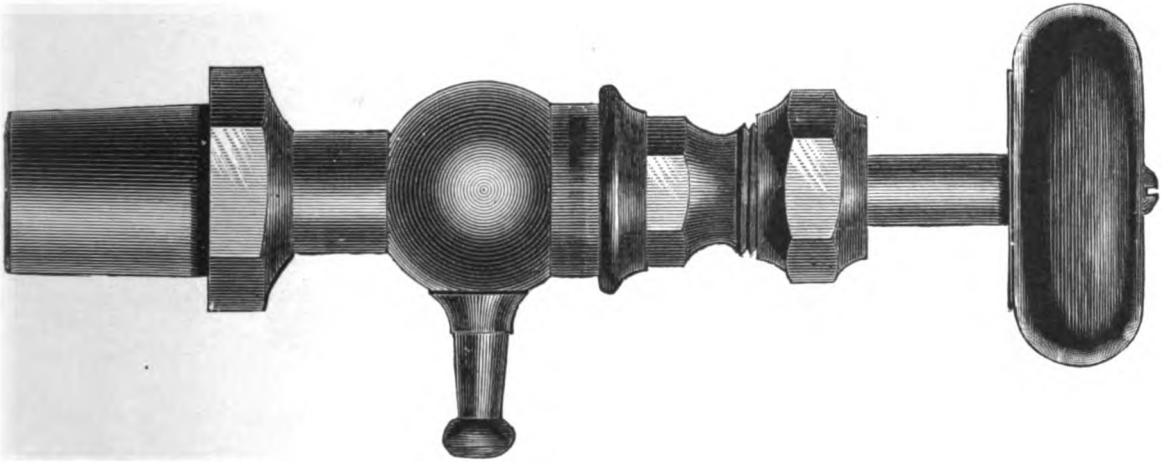


Plate 20.

Diameter of Blank Shank	$\frac{7}{8}$ in.
Finished, each	\$1 50

No. 6.

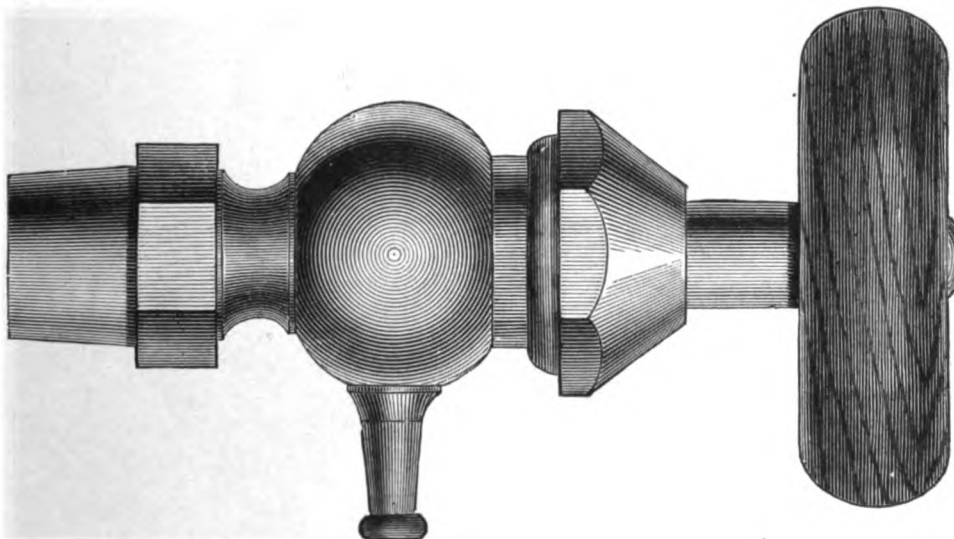
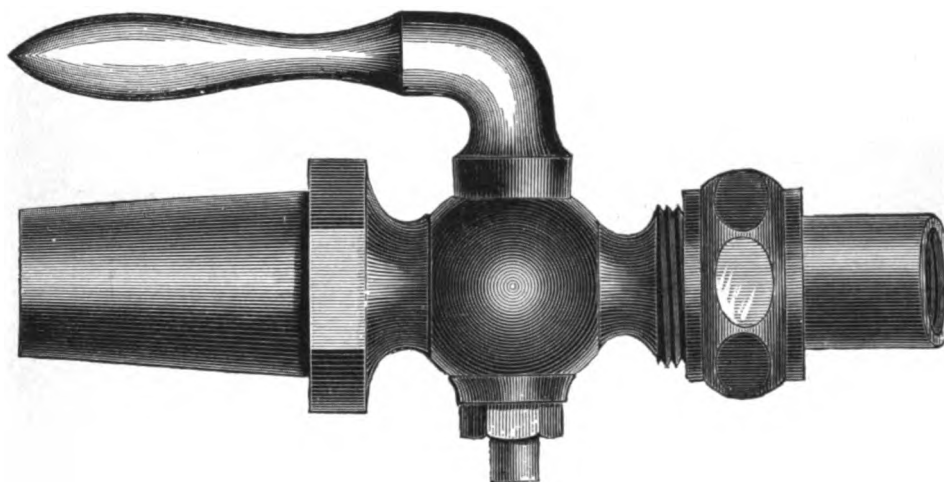


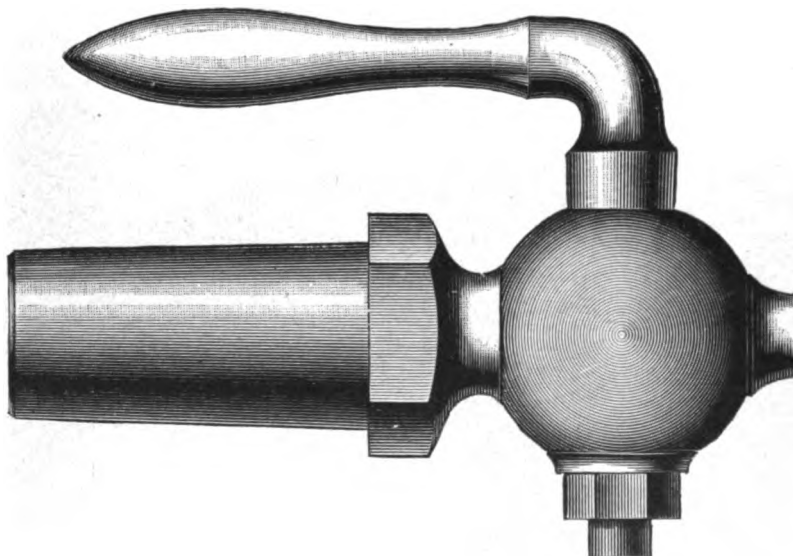
Plate 21.

Diameter of Blank Shank	$\frac{7}{8}$ in.
Finished, each	\$1 75

CYLINDER COCK.**LEVER HANDLE, TAPER SHANK.****WITH UNION.****Plate 22.**

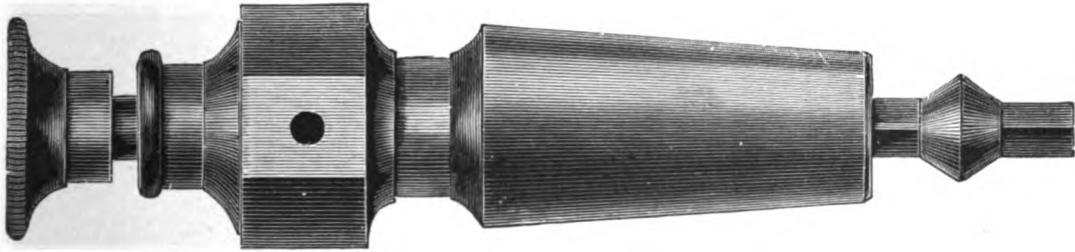
Size of Blank Shank	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Each	\$1 75	2 00	2 50	3 75

Will be furnished with Blank Shanks unless otherwise ordered.

CYLINDER COCKS.**BLANK SHANK, LEVER HANDLE.****Plate 23.**

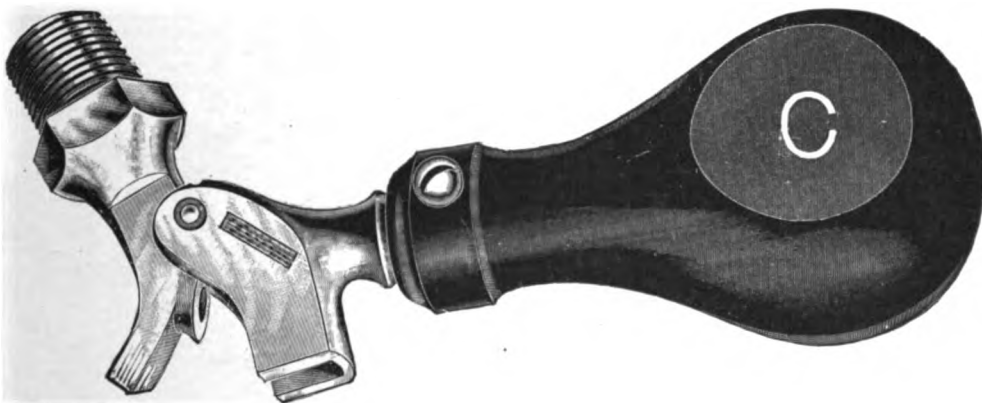
Diameter of Blank Shank	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$
Cuts, Iron Pipe, size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Finished, each	\$0 90	1 00	1 10	1 50	2 00	2 50

Cylinder Cocks will be furnished with Blank Shanks, unless otherwise ordered.

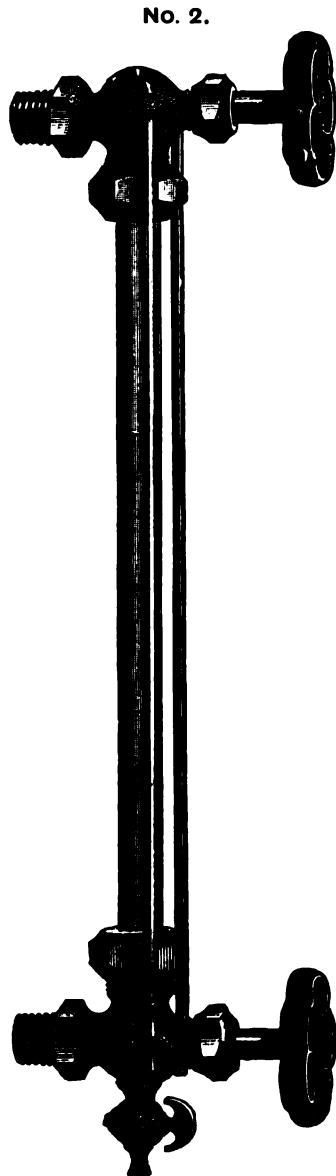
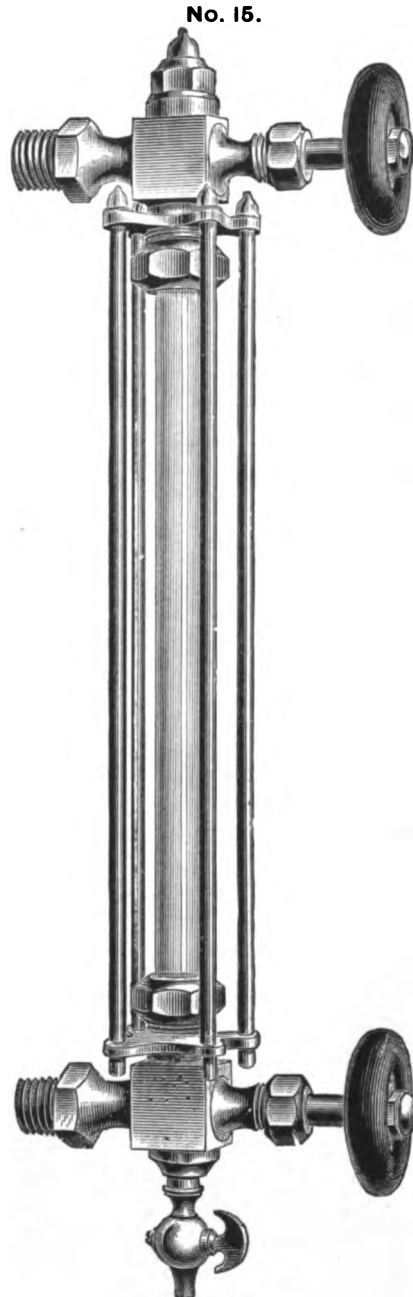
MISSISSIPPI GAUGE COCK.**Plate 24.**

Diameter of Blank Shank	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Cuts Iron Pipe to	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$
Each	\$0 90	90	1 20	1 50	1 80

These Gauge Cocks will be furnished with Blank Shanks unless ordered threaded.

BALL GAUGE COCK.**Plate 25.**

Size cut for Iron Pipe	$\frac{1}{2}$	$\frac{3}{4}$ in.
Each	\$1 00	1 00

WATER GAUGES.**STEAM METAL.****Plate 26.****Plate 27.****WITH TWO GUARDS.**

	With Iron Wheels	With Wood Wheels
No. 1, Rough Body, Glass $\frac{1}{2}$ x 10 inches, cut for $\frac{3}{8}$ inch Iron Pipe, each . .	\$2 75	3 50
No. 2, Rough Body, Glass $\frac{3}{8}$ x 12 inches, cut for $\frac{1}{2}$ inch Iron Pipe, each . .	3 00	3 75
No. 3, Rough Body, Glass $\frac{3}{4}$ x 16 inches, cut for $\frac{3}{4}$ inch Iron Pipe, each . .	4 50	5 25

WITH FOUR GUARDS.

No. 15, Finished Body, Patent Wood Wheels, Glass $\frac{3}{8}$ x 12 inches, cut for $\frac{1}{2}$ inch Pipe, each . .	\$6 00
No. 16, Finished Body, Patent Wood Wheels, Glass $\frac{3}{4}$ x 16 inches, cut for $\frac{3}{4}$ inch Pipe, each . .	8 00

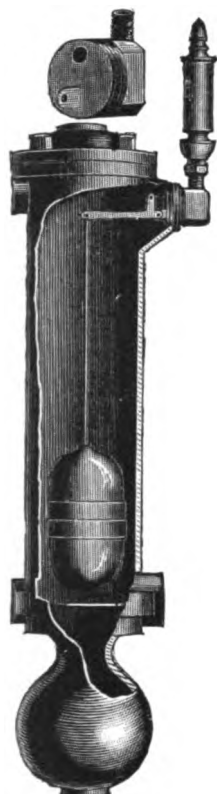
RELIANCE ALARM GAUGES AND WATER COLUMNS.**LOW WATER
ALARM.**

Plate 28.

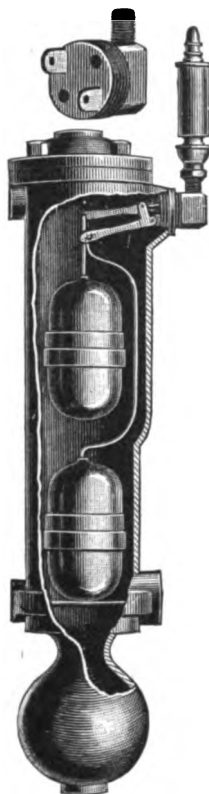
**HIGH AND LOW WATER
ALARM.**

Plate 29.

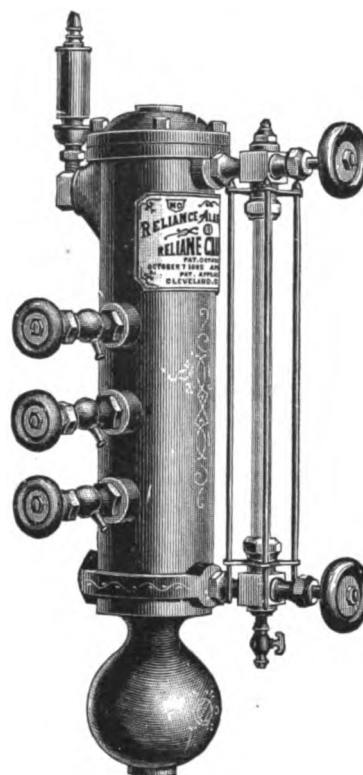
**HIGH AND LOW WATER ALARM.
COMPLETE WITH FITTINGS.**

Plate 30.

DESCRIPTION OF THE LOW WATER ALARM.

These Gauges and Water Columns are so simple in construction that they hardly require detailed description. Plate 28 shows the mechanism of the Low Water Alarm. What is known as a bell-crank lever connects the upright float rod with the whistle valve, and, when in use, with the water at the proper height, the solderless copper float attached to the lower end of the vertical rod is submerged, and, pressing upward, holds the valve closed, but when the water from any cause whatever, such as leakage, stopping of injector, breaking of pumps, or carelessness, gets low enough to rob the float of its support, it sinks of its own gravity, thus opening the valve and blowing the whistle. The spherical projection at the bottom of these gauges is a mud catcher, into which the sediment falls of its own gravity. Owing to smallness of the connection between it and the body of the gauge, this sediment cannot get back into the gauge when the blow-off valve is opened, as in ordinary Water Columns, and the gauge cocks and glass are always clean.

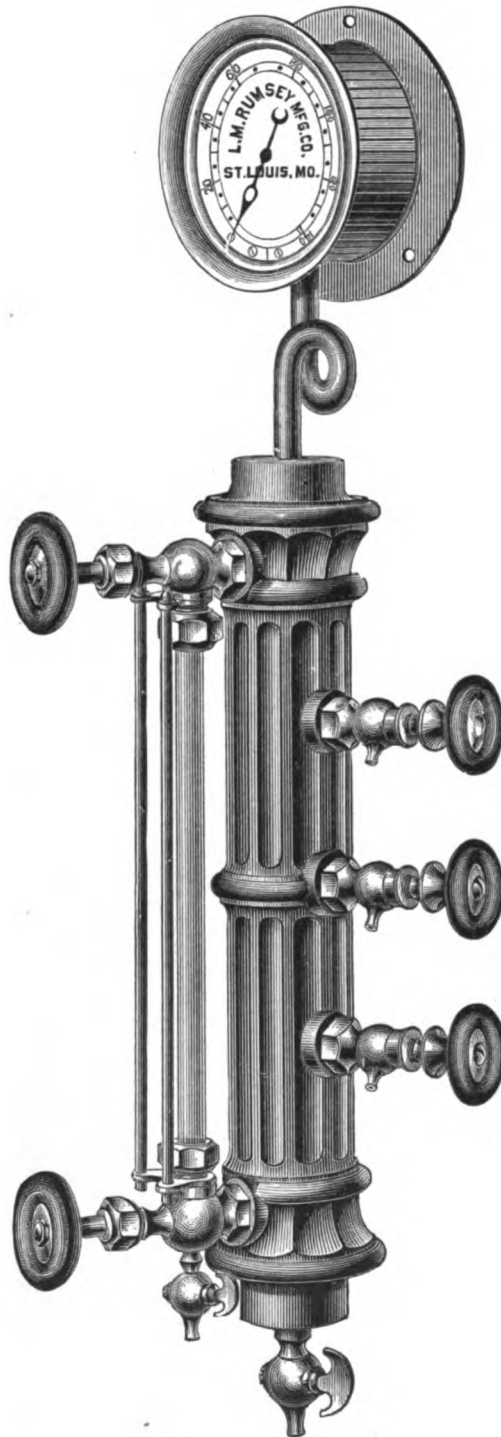
DESCRIPTION OF THE HIGH AND LOW WATER ALARM.

Without complicating or altering the principle of the Combined High and Low Water Alarms we have improved them greatly (Plate 29). The high and low water valves are both combined in the one plug, which is placed about four inches above the high water mark, represented by the center of the upper float, where the valves can never be interfered with by water and sediment. This improvement will be appreciated by all practical steam users. The use of these Gauges on any boiler insures freedom from damages resulting from either high or low water and insures the carrying of a steady gauge of water, the advantage of which is too well understood to need repeating. The valve and valve seats are made of the best steam metal, and none but the best material and best skilled labor are employed in their construction.

Number	Kind of Alarm	Dimensions over all, inches	Diameter of Boiler and Steam Pressure in lbs.		Size of Boiler Connections, inches	Variation bet. alarms	Length of Glass, inches	Distance bet. Gauge Cocks	Size of Trim-mings, inches	Japanned.		Finished Brass.	
			Up to inches	Up to inches						Without G Cocks or Water Gauge	With G Cocks and Water Gauge	Without G Cocks or Water Gauge	With G Cocks and Water Gauge
1	H. & L.	3 1/4 x 23	54	80	1	6	12	3	1/4	\$28 00	\$35 00	\$70 00	\$85 00
1 1/2	H. & L.	4 1/4 x 28	54	150	1 1/4	6	12	3	1/4	28 00	35 00	.....	.....
2	Low.	3 1/4 x 23	60	100	1	..	12	3-	1/4	25 00	32 00	65 00	80 00
5	H. & L.	4 1/4 x 29 1/4	Any	Any	1 1/4	8	16	4	1/4	30 00	40 00	80 00	100 00
6	Low.	4 1/4 x 27	Diam.	Press.	1 1/4	...	14	4	1/4	28 00	37 00	75 00	95 00

Columns made with any variation, from 6 inches to 36 inches between the alarms, for Hazleton, Corliss and similar boilers, and for special purposes.

NOTICE.—When not otherwise stipulated, we ship the columns trimmed, with gauge cocks and water gauge. When ordering state whether right or left hand columns are wanted. A column having gauge cocks on the left hand side when looking at the glass, which is on the front, is a left hand column, and vice versa. The column shown above is a left hand column.

STEAM OR WATER GAUGE COLUMN.**Plate 31.**

	Columns only	Complete with Trimings
No. 1, 12 inch Centers, Boiler Connections $\frac{1}{2}$ inch	\$2 50	15 00
No. 2, 16 inch Centers, Boiler Connections $\frac{3}{4}$ inch	3 50	20 00
No. 3, 19 inch Centers, Boiler Connections 1 inch	4 50	25 00

THE SIGNAL FUSIBLE LOW WATER ALARM.

FOR PORTABLE AND STATIONARY BOILERS AND STEAM THRASHING ENGINES.

Each Alarm comes packed in a box with full directions and ready to be attached to the boiler. The accompanying cut shows the Signal Fusible Low Water Alarm attached to the boiler. The pipe runs through the top of the boiler within three or four inches of the flues, or closer if desired. As long as the bottom of the pipe is covered with water the fusible plug remains intact; but as soon as the water gets below this point, the Alarm being in a perpendicular position drains itself of the water, steam supplants it, and the plug fuses with a loud report—giving notice to the engineer that the water is near the danger line. The steam continues to escape until the valve is closed, when the little brass plug can be taken out and a new fuse inserted. The plug can then be replaced and the valve opened, when the alarm is again ready for action. This fuse is not melted out by fire or heat, but only by steam acting upon the fusible alloy, which melts at 240 degrees. Two fuses are furnished with each Alarm. In using this Alarm no stopping of power is necessary, for when the fuse is melted out the escape of steam can be shut off and a new fuse put in.

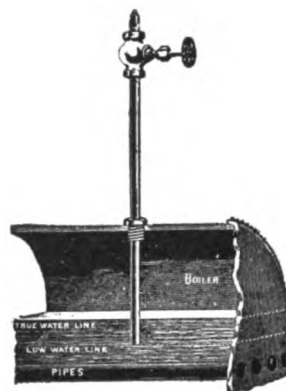


Plate 32.

Price, each \$6 00

THE GEM FUSIBLE LOCKED SAFETY ALARM.

FOR INDICATING LOW WATER IN STEAM BOILERS.

GUARANTEED ALWAYS READY FOR ACTION.



Plate 33.

This device is simple, durable and practical. It can be attached to any steam boiler without any difficulty. A glance at the accompanying cut shows the device attached to a steam boiler. The shell is tapped $\frac{3}{4}$ -inch and a $\frac{1}{2}$ -inch pipe is run down within two or three inches above the top of the flues or crown sheet; when the water in the boiler lowers to this point, the steam will pass up in the device and melt the fusible disc—giving notice to the engineer that the water is near the danger line. This Fusible Alarm is not melted by fire, but by steam acting upon a fusible alloy which melts at 240 degrees; no stopping of power is necessary, for when the disc is melted out the escape of steam can then be shut off and a new disc put in.

This Alarm is self-locked and cannot be tampered with under any circumstances; it has no keys to be carried around, to be lost or stolen; it is provided with a valve between the fusible disc and boiler, which can only be closed when the disc is melted out. The device can only be locked when the disc is in and the valve is open, preventing any mistake. The valve cannot be closed or the disc removed until the latter is melted out by steam passing up into the device.

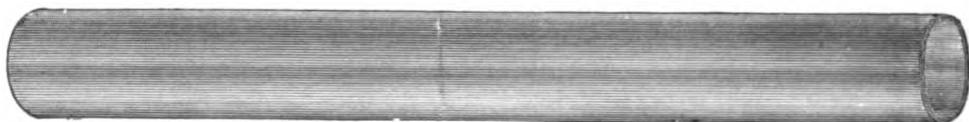
This Alarm has no working parts, and consequently is always ready for action.

The Alarm can be obtained with or without a whistle.

Price, each \$16 00
 With Whistle, each 17 00
 Fusible Disc, each 25

SCOTCH GLASS TUBE.

FOR WATER GAUGES.

**Plate 34.**

Length	10	11	12	13	14	15	16	17	18 in.
External Diameter, $\frac{1}{2}$ inch, per doz .	\$3 00	3 24	3 60	3 84	4 20	4 44	4 80	5 04	5 40
External Diameter, $\frac{5}{8}$ inch, per doz .	3 00	3 24	3 60	3 84	4 20	4 44	4 80	5 04	5 40
External Diameter, $\frac{3}{4}$ inch, per doz .	3 60	3 96	4 32	4 80	5 16	5 52	5 88	6 24	6 60
External Diameter, $\frac{7}{8}$ inch, per doz .	5 04	5 64	6 12	6 60	7 08	7 56	8 16	8 64	9 12
External Diameter, 1 inch, per doz .	6 12	6 72	7 32	7 92	8 52	9 12	9 72	10 32	10 92
Length	19	20	22	24	30	36	48	60	72 in.
External Diameter, $\frac{1}{2}$ inch, per doz .	\$5 64	6 00	6 60	7 20	9 00	10 80	14 52	18 12	21 84
External Diameter, $\frac{5}{8}$ inch, per doz .	5 64	6 00	6 60	7 20	9 00	10 80	14 52	18 12	21 84
External Diameter, $\frac{3}{4}$ inch, per doz .	7 08	7 44	8 16	8 88	11 16	13 44	18 00	22 56	27 12
External Diameter, $\frac{7}{8}$ inch, per doz .	9 60	10 20	11 16	12 12	15 24	18 24	24 36	30 48	36 48
External Diameter, 1 inch, per doz .	11 52	12 12	13 44	14 64	18 24	21 96	29 16	36 48	43 80

60 x $1\frac{1}{4}$ inches, per doz., \$60 00**GLASS TUBE CUTTER.****Plate 35.**

Number	1	2
Price, each	\$2 50	3 00

RUBBER GAUGE GLASS WASHERS.

Price, per doz	\$0 40
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EXTRA BRASS GUARDS.

FOR WATER GAUGES.

14 inches long, each, net	\$0 10
16 inches long, each, net	15
18 inches long, each, net	20
20 inches long, each, net	25

Longer Guards to order.



Plate 36.

PLAIN OIL CUP.

Number	1	2	3	4	5	6	7
Diameter	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Diameter of Blank Shank	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$ in.
Cuts Iron Pipe, size	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$ in.
Each	\$0 25	30	35	40	50	60	90

Number	8	9	10	11	12	13
Diameter	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3 in.
Diameter of Blank Shank	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$ in.
Cuts Iron Pipe, size	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$ in.
Each	\$1 25	1 75	2 25	2 75	3 50	4 00

T HANDLE OIL CUP.**STEAM METAL.**

Number	45	46	47
Diameter	1	$1\frac{1}{8}$	$1\frac{1}{4}$ in.
Diameter of Blank Shank	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$ in.
Cuts Iron Pipe to	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$
Each	\$1 00	1 25	1 50

Number	48	49	50
Diameter	$1\frac{1}{2}$	$1\frac{3}{4}$	2 in.
Diameter of Blank Shank	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$ in.
Cuts Iron Pipe to	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ in.
Each	\$2 00	2 50	3 00

Number	51	52	53
Diameter	$2\frac{1}{4}$	$2\frac{1}{2}$	3 in.
Diameter of Blank Shank	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$ in.
Cuts Iron Pipe to	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
Each	\$3 75	4 50	6 00

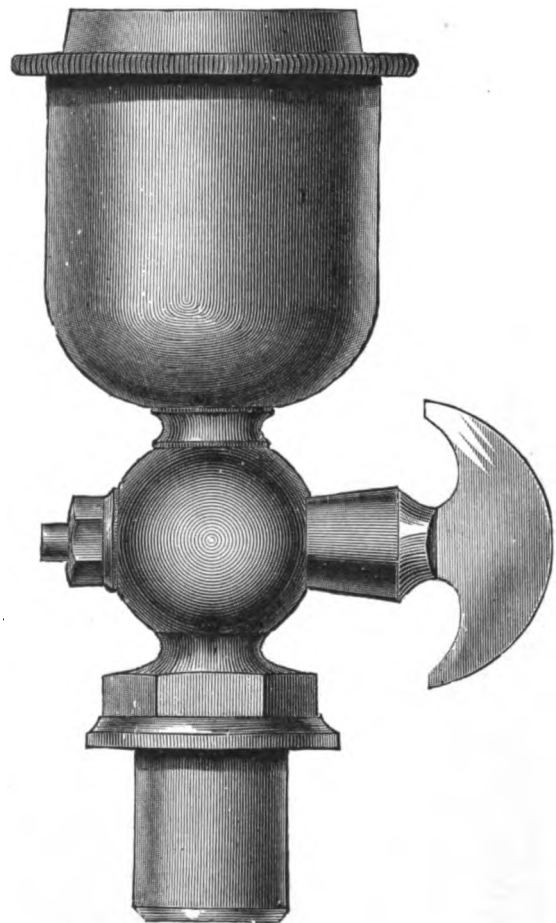


Plate 37.

LEVER HANDLE OIL CUP.

STEAM METAL.

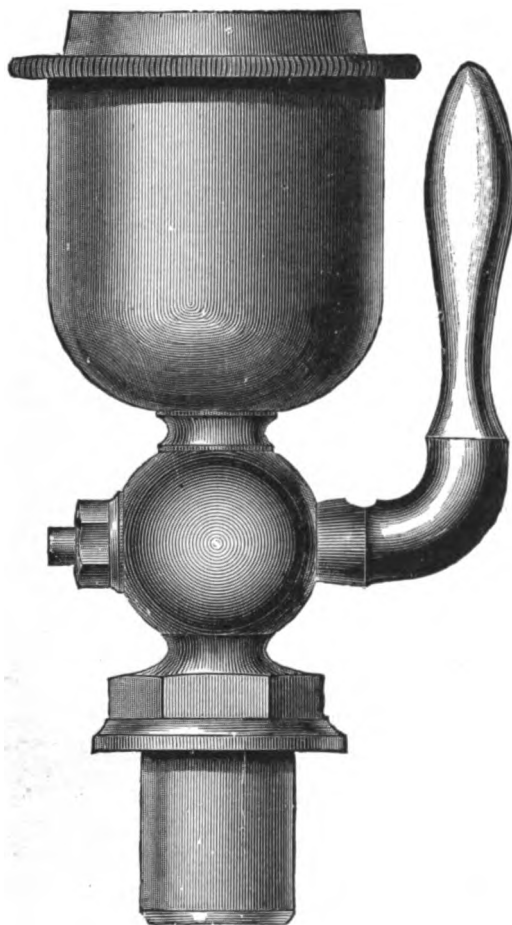


Plate 38.

Number	54	55	56	57	58	59	60	61	62
Diameter	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	3 in.
Diameter of Blank Shank	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$ in.
Cuts Iron Pipe to	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$ in.
Each	\$1 10	1 35	1 60	2 20	2 75	3 25	4 00	5 00	6 50

LUBRICATOR.

PATENT WOOD HANDLES.

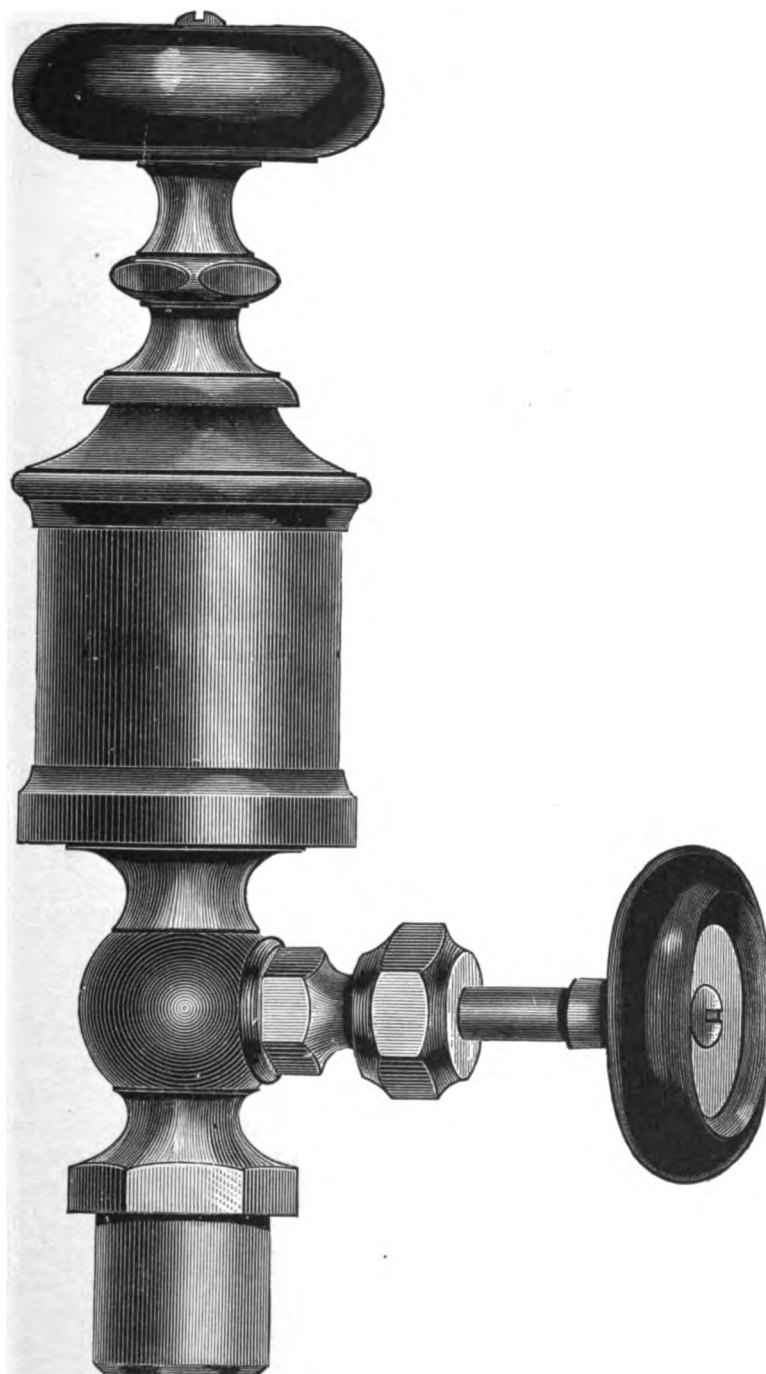


Plate 39.

Number	1	2	3	4	5	6	7	8	9	10	11
Diameter	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Diameter of Blank Shank.	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$ in.
Cuts of Iron Pipe, size . .	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$ in.
Each	\$1 75	2 00	2 20	2 40	2 60	2 90	3 25	3 75	4 75	7 00	10 00

RUMSEY'S I X L OIL CUPS.

WITH SELF-CLOSING SPRING COVER.



Plate 40.



Plate 41.

We claim an advantage in this Cup over the ordinary oiler in its Self-closing Spring Cover. The spring is attached to the lid and passes down through oil way, where it is held by a loop, which admits of the cover being turned at will, without affecting the spring. In filling the Cup the cover is simply lifted out and to one side, and when released springs back again into place. No amount of jar or motion can displace it, and cover can never be lost. It is especially adapted for Traction and Portable engines, etc. A small amount of wicking is placed at the mouth of the oil way, which prevents the oil feeding faster than necessary. The time saved in unscrewing and screwing on covers, replacing lost ones, etc., will about pay for this Cup. The tension of the spring can be increased by simply giving the loop an extra turn with a pair of nippers. Extra springs can be put in by any user, and will be furnished upon application at a nominal charge.

Number	0	1	2	3	4	5
Size Shank	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$ in.
Capacity	$\frac{1}{4}$	$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{3}{4}$	$3\frac{1}{2}$ oz.
Per doz	\$6 00	7 50	10 00	15 00	19 50	24 00
Extra Springs, per doz	1 00	1 25	1 50	1 75	2 00	2 25

SAFETY CRANK PIN OILERS.

"SAFETY."



Plate 42.

"SAFETY."

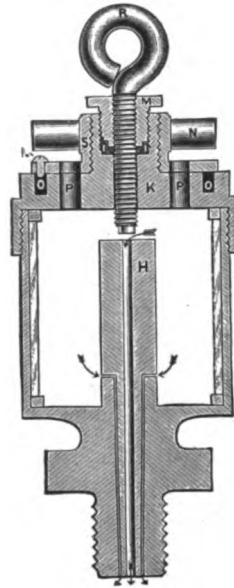


Plate 43.

Absolutely Automatic. Finest Regulation.
Economical.

Two Separate and Distinct Feeds. Parts Inter-
changeable. Filled from Outside.

Size Numbers	400	401	402	403	404	405
Outside Diameter of Glass	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2 in.
Height of Glass	1 1/8	1 3/8	1 1/2	1 3/4	2 1/8	2 3/8 in.
Capacity	1/2	7/8	1 1/4	2 1/4	3 1/2	4 3/4 oz.
Pipe Thread of Shank	1/4	1/4	3/8	3/8	1/2	1/2 in.
Price, Brass Finish, each	\$1 50	1 75	2 00	2 50	3 00	4 00
Price, Nickel-plated, each	1 90	2 20	2 50	3 00	3 60	4 70
Price Extra Glasses, net	08	10	11	12	15	25
Extra Cork Washer, per doz	12	18	24	30	36	42

All sizes made in above style, also in "locomotive" pattern on which the threaded shank comes direct from bottom and square is on body of cup.

LUNKENHEIMER'S INDEX SIGHT-FEED GLASS OIL CUPS.**RUBY.****Plate 44.****CROWN.****Plate 45.**

The Lunkenheimer Crown and Ruby Index Sight-Feed Glass Oil Cups have an "index" device for regulating the feed of oil, and an indicator arm turning on the lid to mark the notch giving the desired feed. The feed can be instantly turned off, and on again, by replacing the index lever in the notch of the indicator arm. When the index arm is closed the lever can be left to stand up out of the notch, thus acting as an indicator to show from a distance that the feed is shut off. They fulfill all the requirements for dynamo and engine use.

Number	0	1	1½	2	3	4	5	6
Outside Diameter of Glass	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	1½	1¾	1⅞	1⅞	2½	2¾	3	4 in.
Capacity	⅝	1	1½	2½	4	5	10	18 oz.
Pipe Thread	⅝	¾	¾	¾	¾	¾	¾	¾ in.
Finished Brass, each	\$1 25	1 50	1 75	2 10	2 55	3 15	3 90	4 80
Nickel-Plated, each	1 40	1 70	2 00	2 35	2 85	3 50	4 30	5 30
Extra Glass, net, each	08	10	10	12	15	25	35	65

To avoid mistakes when ordering Glasses and Cork Washers, specify name and number of cup as stamped on the cup.

LUNKENHEIMER'S SIGHT-FEED GLASS OIL CUPS.

ROYAL.

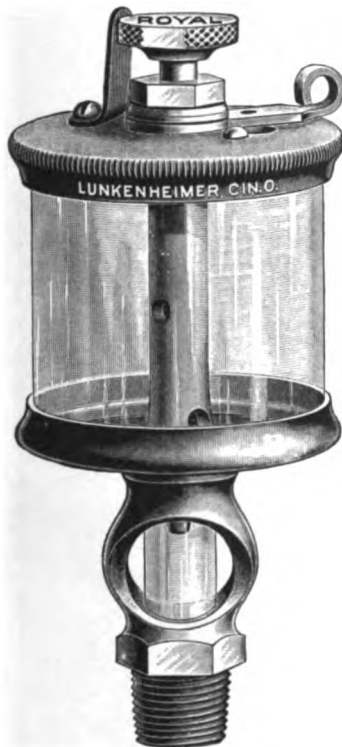


Plate 46.

RIVAL.



Plate 47.

The Royal and Rival Sight-Feed Glass Oil Cups are unsurpassed for engine and dynamo use; they are simple and practical, and so constructed, that when the desired feed is once set they can be stopped and started at will without resetting, the spring acting as a lock and indicator when engaging at (E).

Directions to Set Feed.—Regulate the feed by turning the milled cover, so that when the flattened side of thumb-nut engages the spring the desired feed is obtained. When the desired feed is once established, it can be shut off or put on by turning the milled thumb-nut (E); i. e., to the right, feed off; to the left, feed on.

Number	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . . .	1¼	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	1	1½	1¾	1¾	1¾	2½	2¾	3	4 in.
Capacity	½	¾	1	1½	2½	4	5	10	18 oz.
Pipe Thread	⅝	⅝	¾	¾	¾	¾	¾	¾	¾ in.
Finished Brass, each	\$1 10	1 25	1 50	1 75	2 10	2 55	3 15	3 90	4 80
Nickel-plated, each	1 20	1 40	1 70	2 00	2 35	2 85	3 50	4 30	5 30
Extra Glasses, net, each	06	08	10	10	12	15	25	35	65

To avoid mistakes when ordering Glasses and Cork Washers, specify name and number of Cup as stamped on the Cup.

LUNKENHEIMER'S SLIDE TOP GLASS OIL CUPS.



Plate 48.

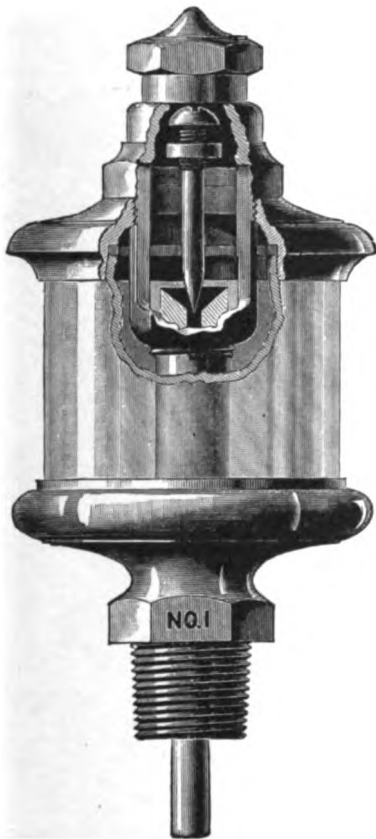
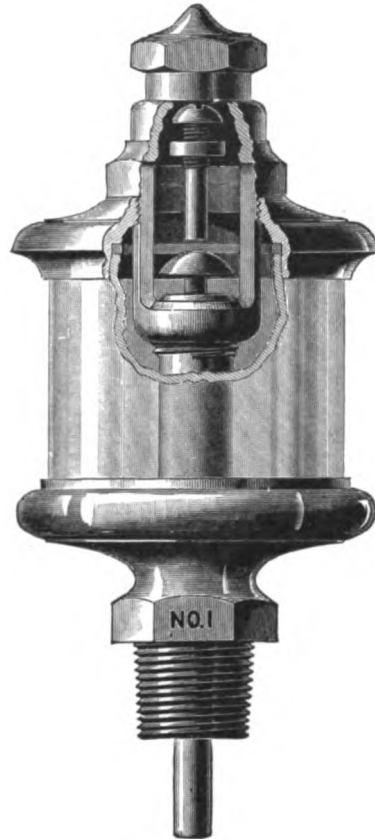


Plate 49.

The simplest and most efficient Oil Cups in the market, suitable for all engine bearings and shafting. The only Slide Top Oil Cup that will not shake apart, nor the feed unset, when placed on jarring machinery. This makes them especially adapted for traction engines. They are easily filled and regulated, and made of few parts.

Number	000	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . .	1	1⅝	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	¾	1	1⅝	1¾	1⅝	1⅞	2⅞	2⅞	3	4 in.
Capacity	¼	⅝	⅝	1	1½	2½	4	5	10	18 oz.
Pipe Thread	⅝	⅝	⅝	¾	¾	¾	¾	¾	¾	¾ in.
Finished Brass, each	\$0 70	75	80	1 00	1 25	1 50	1 90	2 40	3 10	4 00
Nickel-plated, each	80	85	95	1 20	1 50	1 75	2 20	2 75	3 50	4 50
Extra Glasses, net, each . .	05	06	08	10	10	12	15	25	35	65

To avoid mistakes when ordering Glasses and Cork Washers, specify name and number of Cup as stamped on the Cup. The Yankee is not made smaller than number 00.

LUNKENHEIMER'S AUTOMATIC ROD CUPS.**FOR ENGINE CRANK PINS.****SCREW FEED.****Plate 50.****NEEDLE VALVE FEED.****Plate 51.**

These Cups are designed for Connecting Rod Bearings and feed only while engine is running.

Number	0	1	1½	2	3	4
Outside Diameter of Glass	1¼	1½	1¾	2	2¼	2½ in.
Height of Glass	1½	1¾	1⅝	1⅞	2¼	2⅜ in.
Capacity	⅝	1	1½	2½	4	5 oz.
Pipe Thread	⅛	¼	¼	⅜	⅜	⅜ in.
Price, each	\$1 10	1 50	2 00	2 50	3 00	4 00
Extra Glasses, net, each	08	10	10	12	15	25

Rod Cups with Needle Valve Feed not made smaller than No. 1.

LUNKENHEIMER'S INDEX GLASS OIL CUPS.

VICTOR.



Plate 52.

AJAX.

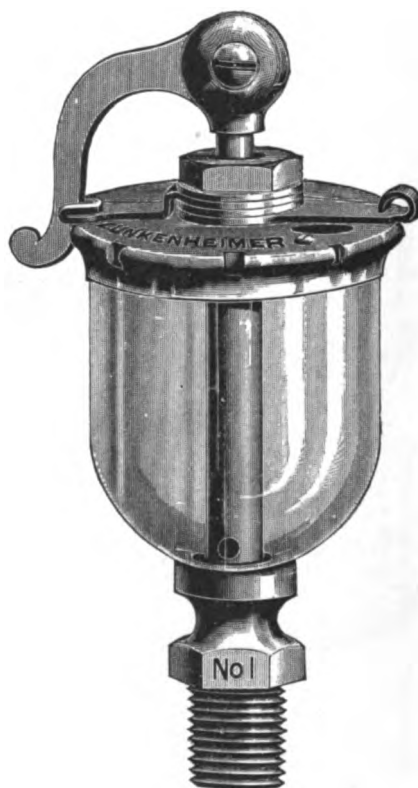


Plate 53.

The Lunkenheim Victor and Ajax Index Glass Oil Cups are provided with a simple index device for regulating the feed of oil, and have an indicator arm pivoted on the stem and turning on the lid to mark the notch giving the desired feed. The feed can be instantly turned off, and on again, by replacing the lever in the notch of the indicator arm. When the index arm is closed the lever can be left to stand up out of the notch, thus acting as an indicator, to show from a distance that the feed is shut off.

Number	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . . .	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	1⅛	1¾	1⅝	1⅞	2⅛	2⅜	3	4 in.
Capacity	⅝	1	1½	2½	4	5	10	18 oz.
Pipe Thread	⅛	¼	¼	⅜	⅜	⅜	½	½ in.
Finished Brass, each	\$1 00	1 20	1 45	1 75	2 15	2 70	3 40	4 30
Nickel-plated, each	1 15	1 40	1 70	2 00	2 45	3 05	3 80	4 80
Extra Glasses, net, each	0 08	10	10	12	15	25	35	65

To avoid mistakes when ordering Glasses and Cork Washers, specify name and number of Cup as stamped on the Cup.

**POWELL'S PATENT IMPROVED
AUTOMATIC CRANK OR
WRIST PIN OILER.**

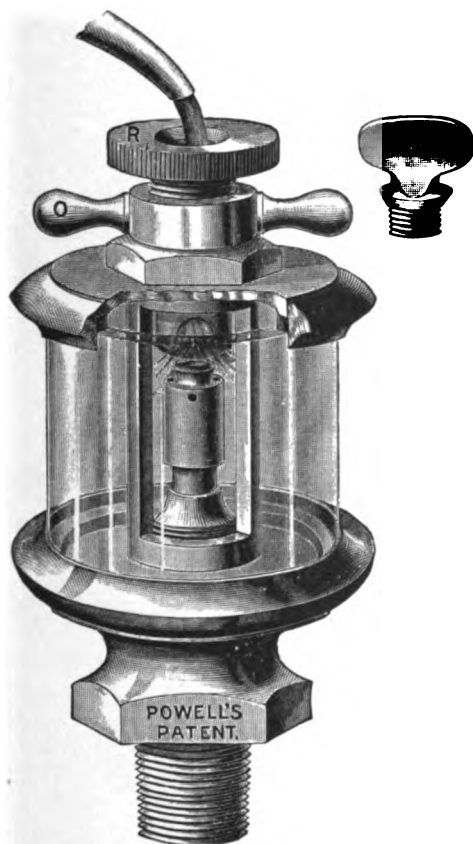


Plate 54.

**POWELL'S PATENT
IMPROVED SLIDE OIL CUP.**

FOR SLIDES AND ECCENTRICS,
AND ARE ESPECIALLY ADAPTED FOR SLOW
SPEED ENGINES.

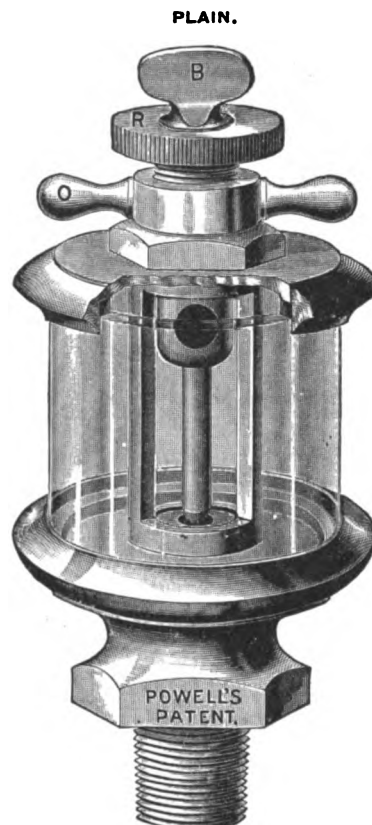


Plate 55.

POWELL'S PATENT IMPROVED AUTOMATIC CRANK OR WRIST PIN OILER.

Numbers	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . . .	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	1½	1¾	1¾	1¾	2½	2¼	2¾	4 in.
Capacity	½ oz.	¾ oz.	1 oz.	2 oz.	¼ pt.	½ pt.	½ pt.	1 pt.
Size of Shank, Pipe Thread . .	¼	¼	¾	¾	¾	¾	¾	¾ in.
Finished, each	\$1 10	1 50	2 00	2 50	3 00	4 00	6 00	9 00
Nickel-Plated, each	1 25	1 70	2 25	2 75	3 30	4 35	6 50	9 50

POWELL'S PATENT IMPROVED SLIDE OIL CUP.

Numbers	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . . .	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	1½	1¾	1¾	1¾	2½	2½	2¾	4 in.
Capacity	½ oz.	¾ oz.	1 oz.	2 oz.	¼ pt.	½ pt.	½ pt.	1 pt.
Size of Shank, Pipe Thread . .	¼	¼	¾	¾	¾	¾	¾	¾ in.
Plain—Finished	\$1 10	1 20	1 35	1 60	2 00	2 70	3 45	4 70
Plain—Nickel-Plated	1 30	1 40	1 65	1 90	2 30	3 00	3 85	5 20

POWELL'S PATENT CROSS BAR SIGHT-FEED OILER.

WITH INDEPENDENT STOP FEED.

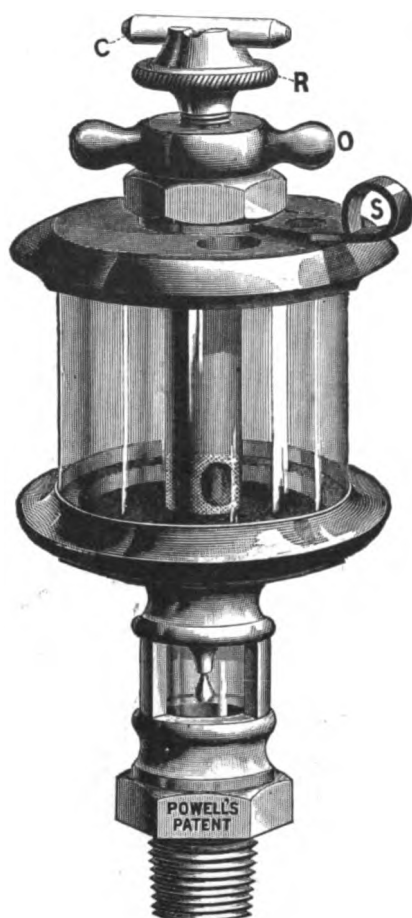


Plate 56.

POWELL'S PATENT IMPROVED GLASS ENGINE OILER.

WITH PATENT SNAP LEVER.



Plate 57.

POWELL'S PATENT CROSS BAR SIGHT-FEED OILER.

Numbers	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . .	1	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	7/8	1⅛	1⅜	1⅝	1⅞	2⅛	2¼	2¾	4 in.
Capacity . . . . .	...	½ oz.	¾ oz.	1 oz.	2 oz.	¼ pt.	½ pt.	¾ pt.	1 pt.
Size of Shank, Pipe Thread . .	⅛	¼	½	¾	1	1½	2	2½	3 in.
Finished, each	\$1 30	1 40	1 50	1 75	2 00	2 25	2 65	3 35	4 50
Nickel-plated, each	1 55	1 65	1 75	2 10	2 35	2 65	3 10	3 85	5 10

POWELL'S PATENT IMPROVED GLASS ENGINE OILER.

Numbers	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . .	1	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	7/8	1⅛	1⅜	1⅝	1⅞	2⅛	2¼	2¾	4 in.
Capacity . . . . .	...	½ oz.	¾ oz.	1 oz.	2 oz.	¼ pt.	½ pt.	¾ pt.	1 pt.
Size of Shank, Pipe Thread . .	⅛	¼	½	¾	1	1½	2	2½	3 in.
Finished, each	\$0 75	0 80	1 00	1 25	1 50	1 90	2 40	3 10	4 00
Nickel-plated, each	85	95	1 20	1 50	1 75	2 20	2 75	3 50	4 50
Extra Glasses, each	06	08	10	10	12	15	25	35	65
Cork Washers, per dozen . . .	18	24	30	36	40	45	50	60	75

POWELL'S PATENT SIGNAL OILER.

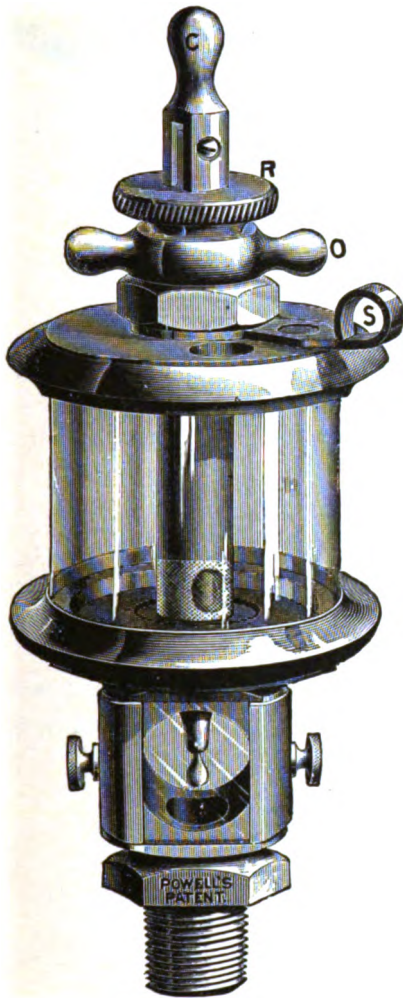


Plate 58.

Lever Up.—Shows oil dropping while machinery runs.

Numbers	0	1	1½	2	3	4	5	6
Outside Diameter of Glass	1¼	1½	1¾	2	2¼	2½	3	3½ in.
Height of Glass	1½	1¾	1¾	1¾	2½	2¾	2¾	4 in.
Capacity	½ oz.	¾ oz.	1 oz.	2 oz.	¼ pt.	½ pt.	¾ pt.	1 pt.
Size of Shank, Pipe Thread	¼	¼	¾	¾	¾	½	½	½ in.
Finished, each	\$3 00	3 25	3 50	3 75	4 25	5 25	7 25	9 25
Nickel-plated, each	3 50	3 75	4 00	4 25	4 75	5 75	8 00	10 25

POWELL'S PATENT SIGNAL OILER.

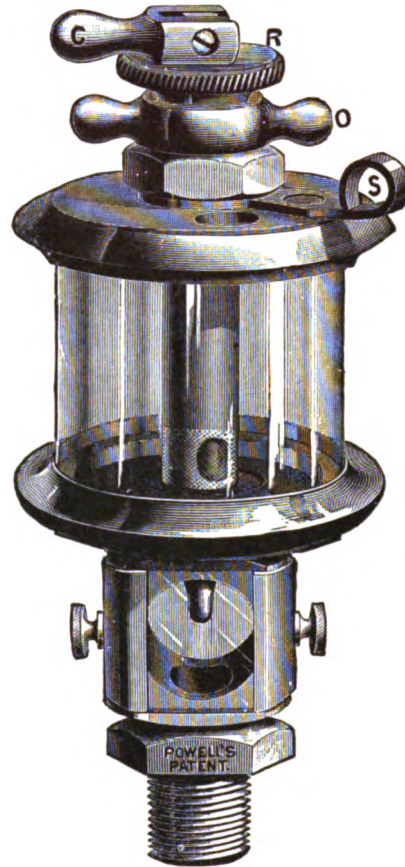


Plate 59.

Lever Down.—Shows flow of oil stopped while machinery stops.

Description.—This Cup has been designed especially for Dynamo and high grade Steam engine use. The Sight Feed Chamber is fitted with square window panes secured by brass clips. They can easily be removed for cleansing or repairs at any time without stopping the oil feed and while the machine is running. This is an invaluable advantage to all users of electrical machines. The feed drop is regulated by the milled screw (R) just under the top Signal Lever (C) and when proper feed is secured is locked in place by jamb nut (O). The flow of oil is started with Signal Lever (C) up, as shown in left hand illustration, and can be instantly shut off by dropping the lever down, as represented in the right hand view, without disturbing the set of feed, as the operation of the Signal Lever is independent of feed regulator. The filling hole in the top is covered by our Patent Snap Lever, which can be moved either to the right or left. Absolutely no waste of oil by the use of these Oilers.

LUNKENHEIMER'S AUTOMATIC NEEDLE VALVE OIL FEEDER.

PLAIN TOP.

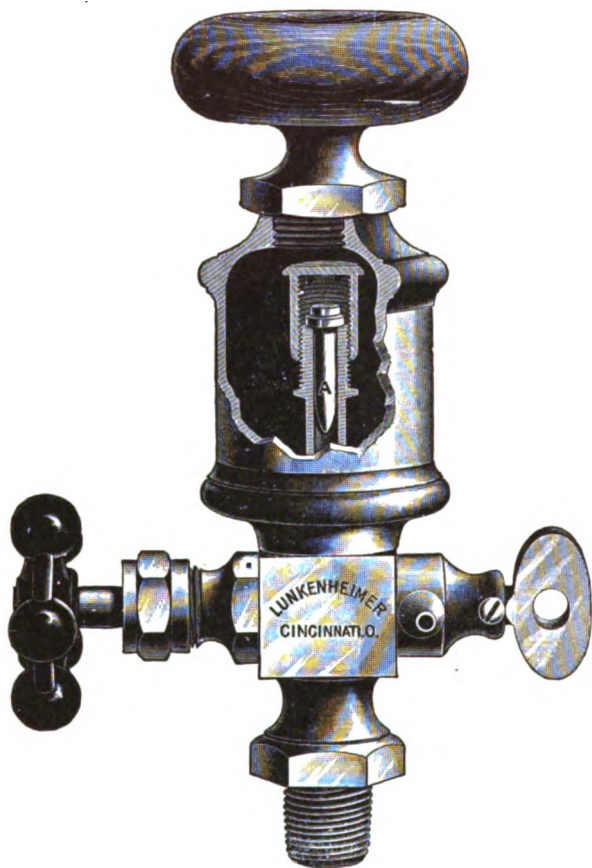


Plate 60.

LUNKENHEIMER'S GLASS BODY OIL PUMP.

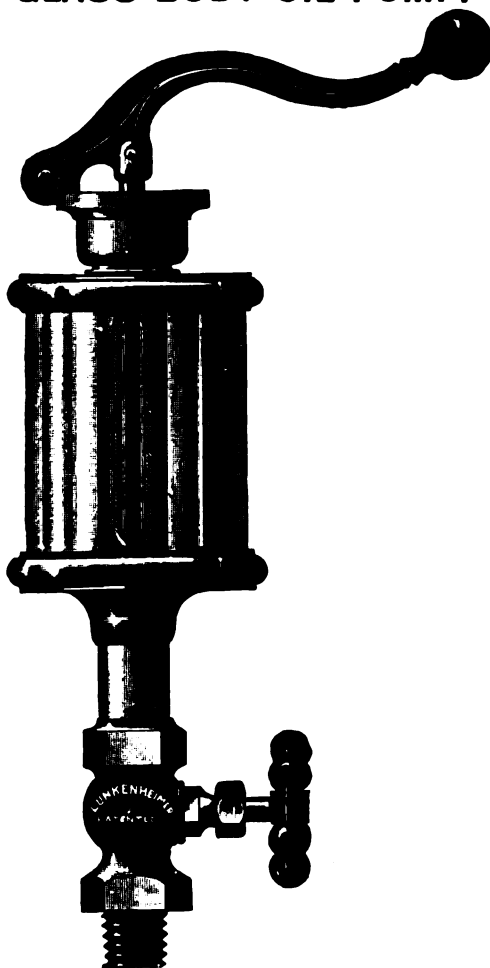


Plate 61.

LUNKENHEIMER'S AUTOMATIC NEEDLE VALVE OIL FEEDER.

Lunkenheim's Automatic Needle Valve Oil Feeder is intended for Slide Valve Engines only, works automatically, and must be placed on the steam chest. The stop valve must always be left open, except when filling cup with oil. Do not drain off the water until ready to fill the cup with oil. The lubricator stops feeding when the engine stops running, and is about properly adjusted as shipped. To regulate the feed, screw yoke "A" up or down, thereby increasing or decreasing the lift of needle. The greater the lift of the needle the more oil is fed.

Diameter	1 3/4	2	2 1/2	3 in.
Capacity	1/4	1/2	3/4	1 pt.
Pipe Thread	3/8	1/2	1/2	3/4 in.
Plain Top, each	\$4 70	6 20	7 70	9 00
Brass Top, with Glass Gauge, each . . . . .	.....	.....	11 30	14 50

A card with full directions for using the Oil Feeder is attached to every cup.

LUNKENHEIMER'S GLASS BODY OIL PUMP.

Number	1	2
Outside Diameter of Glass	1 3/4	3 in.
Shank, Pipe Thread	3/8	1/2 in.
Capacity	1/2	1 pt.
Brass, each	\$7 60	10 00
Nickel-plated, each	8 00	11 00
Extra Glasses, Net, each	20	60

CYLINDRICAL AND URN-SHAPED GLASSES.**FOR LUNKENHEIMER OIL CUPS.****CYLINDRICAL.****Plate 62.**

These Glasses are clear, strong and uniform in size, and interchangeable with all styles of Glass Cups made by us.

URN.**Plate 63.**

Number	000	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass . . .	1	1⅛	1¼	1½	1¾	2	2¼	2⅝	3	3½ in.
Height of Glass	⅞	1	1⅛	1⅜	1⅝	1⅞	2⅛	2⅜	3	4 in.
Price, net, each	\$0 05	06	08	10	10	12	15	25	35	65
Cork Washers, net, per dozen . .	15	18	24	30	36	40	45	50	60	75

LUNKENHEIMER'S AUTOMATIC AND PLAIN BRASS GREASE CUPS.

AUTOMATIC.

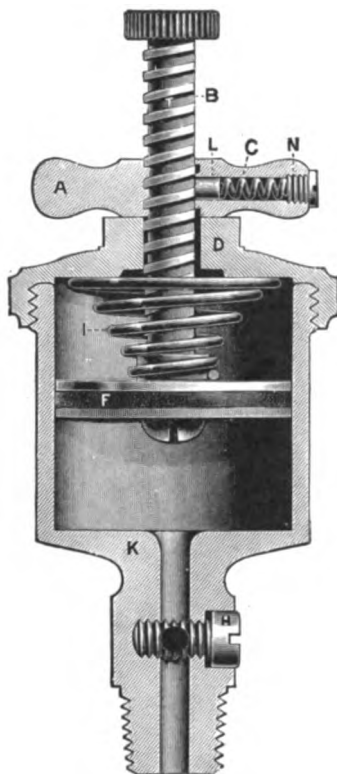


Plate 64.

Number	0	1	2	3	4
Inside Diameter	1 1/4	1 1/2	2	2 1/2	3 in.
Pipe Thread	1/4	1/2	3/8	1/2	1/2 in.
Finished Brass, each	\$2 00	2 50	3 20	4 30	6 00
Nickel-plated, each	2 25	2 80	3 60	5 00	6 75

PLAIN.



Plate 65.

Number	00	0	1	2	3	4
Inside Diameter	1	1 1/4	1 1/2	2	2 1/2	3 in.
Pipe Thread	1/8	1/4	1/2	3/8	1/2	1/2 in.
Finished Brass, each	\$0 70	0 90	1 15	1 50	2 15	2 90

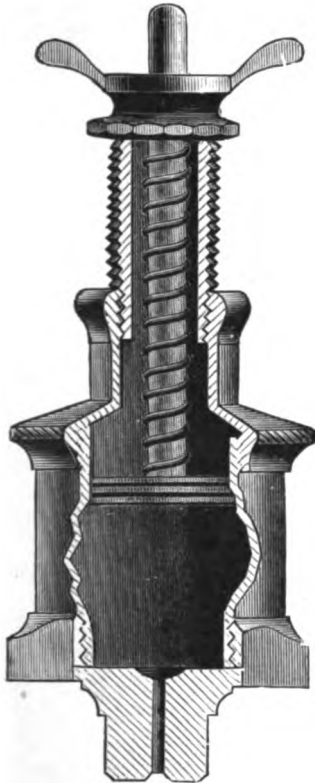


Plate 66.

COMPRESSION GREASE CUP.

No. 1, Brass, holds 1½ ounces lubricant, each	\$2 50
No. 2, Brass, holds 2½ ounces lubricant, each	3 00
No. 3, Brass, holds 8 ounces lubricant, each	5 00

**THE SAME CUP IN IRON, HANDSOMELY
JAPANNED.**

No. 1, holds 1½ ounces lubricant, each	\$1 50
No. 2, holds 2½ ounces lubricant, each	2 00
No. 3, holds 8 ounces lubricant, each	2 50

For the above Cups use No. 3 Nonpareil Grease, which is sold
in 5, 10, 25, and 50 pound cans.

Per pound	\$0 20
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LUNKENHEIMER'S BRASS LOOSE PULLEY OILER.

Plate 67.

This Oiler must be attached to hub of pulley, is easily filled and regulated, will not throw or waste oil, and a trial will convince users that it is a simple and satisfactory oiler for loose pulleys. It is guaranteed to give satisfaction, one filling lasting from two to four weeks, and feeding only when in motion.

Number	0	1	2	3	4
Outside Diameter	1	1¼	1½	1¾	2 in.
Capacity	¼	½	¾	1¼	1¾ oz.
Price	\$0 25	30	40	50	65

Shanks on Nos. 0, 1, 2 are threaded ⅜ inch on point, 16 threads to the inch.

Shanks on Nos. 3, 4 are threaded ¼ inch Pipe Thread.

POWELL'S PATENT IMPROVED COMPRESSION GREASE CUPS.

ALL BRASS—CLASS A.

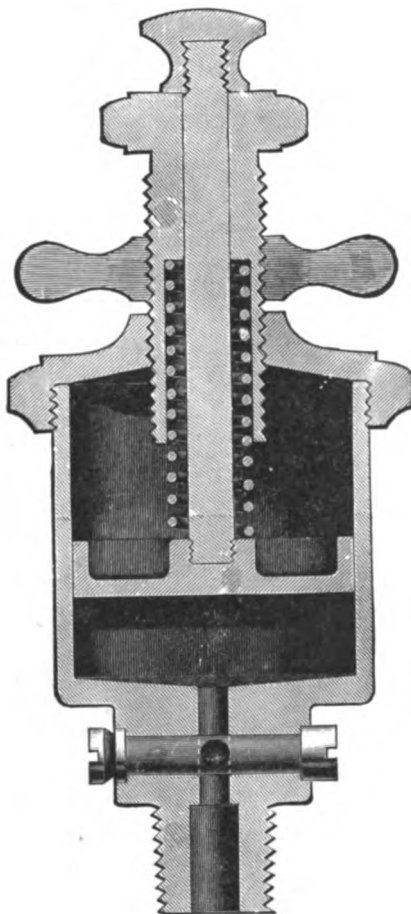


Plate 69.

Number	00	0	1	2	3	4
Diameter of Body	1	1 1/4	1 1/2	2	2 1/2	3 in.
Capacity	1/2	1	1 1/2	3	7	12 oz.
Size of Shank, Pipe Thread	1/4	1/4	3/8	3/8	1/2	1/2 in.
Class A, Finished, per dozen	\$24 00	30 00	36 00	46 25	60 00	72 00
Class A, Nickel-plated, per dozen	27 00	33 00	39 00	50 00	64 00	81 00

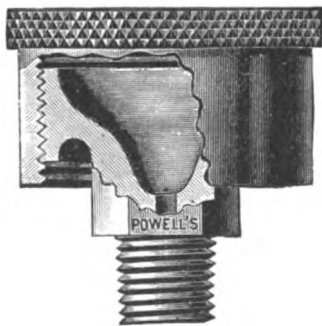


Plate 68.

POWELL'S SHORT PATTERN GREASE CUP.

CLASS E.

Number	00	0	1	2	3
Diameter of Cup	1	1 1/4	1 1/2	2	2 1/2 in.
Size of Shank, Pipe Thread	1/4	1/4	3/8	3/8	1/2 in.
Capacity	1/4	1/2	3/4	1 1/2	3 1/2 oz.
Rough Brass, each	\$0 56	74	96	1 28	1 76
Finished Brass, each	70	90	1 15	1 50	2 15
Finished and Plated, each	82	1 06	1 36	1 80	2 60

POWELL'S PATENT IMPROVED COMPRESSION GREASE CUPS.

CLASS C—BRASS.

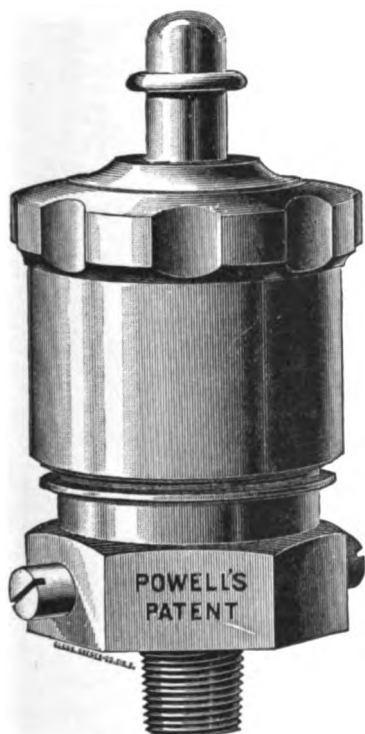


Plate 70.

CLASS C—ALL IRON.

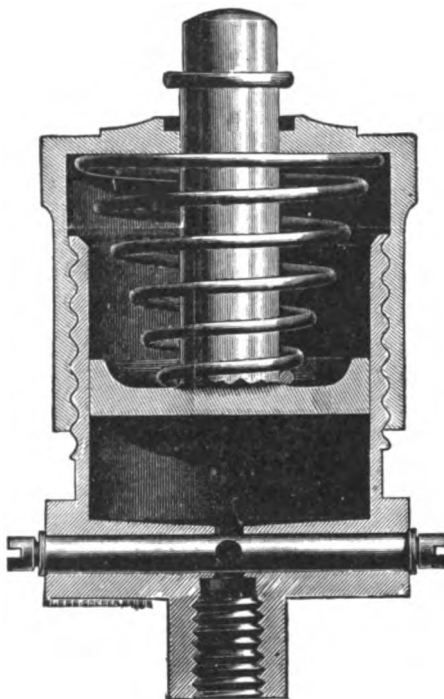


Plate 71.

POWELL'S PATENT IMPROVED COMPRESSION GREASE CUPS—BRASS.

Number	00	0	1	2	3
Diameter of Body	1	1¼	1½	2	2½ in.
Capacity	½	1	1½	3	7 oz.
Size of Shank, Pipe Thread	¼	¼	⅜	⅜	½ in.
Class C, Finished, per doz	\$21 00	25 00	29 00	33 50	50 00
Class C, Nickel-plated, per doz	24 00	28 00	32 00	37 00	54 00

POWELL'S PATENT IMPROVED COMPRESSION GREASE CUPS—ALL IRON.

Number	00	0	1	2	3
Diameter of Cup	1	1¼	1½	2	2½ in.
Capacity	½	1	1½	3	7 oz.
Size of Male Shank, Pipe Thread	¼	¼ & ⅜	⅜ & ½	⅜ & ½	½ in.
Size of Female Shank, Pipe Thread	¼	¼ & ⅜	⅜ & ½	⅜ & ½	½ in.
Painted, per doz	\$10 00	11 25	12 00	12 50	25 00

POWELL'S PATENT BOILER OIL FEEDER.

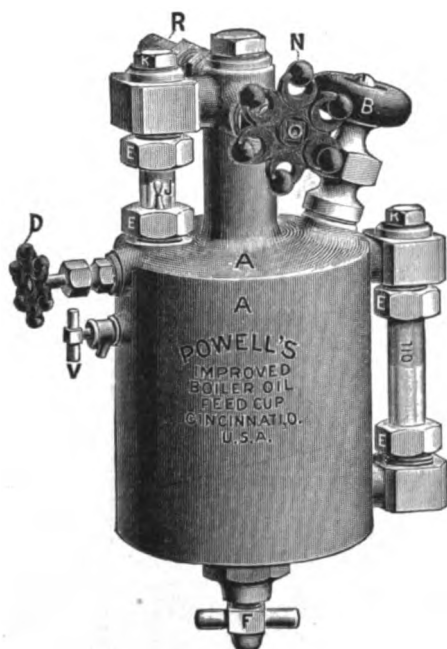
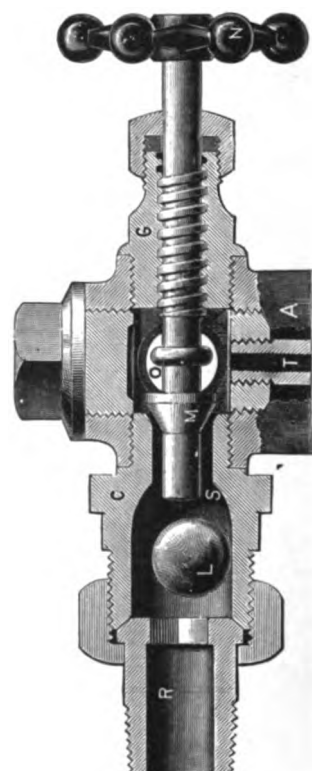


Plate 72.

CROSS SECTION THROUGH STOP VALVE AND FEED SHANK.



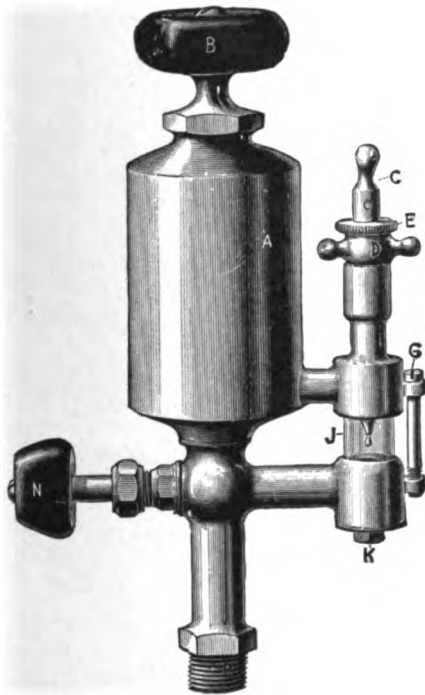
- (A) Oil Chamber.
- (B) Filling Plug.
- (NM) Shut-Off.
- (D) Regulating Valve.
- (F) Drain Valve.
- (L) Ball Valve.
- (S) Ball Valve Seat.
- (H) Supporting Bracket.
- (K) Removable Plug to Replace Glass.
- (R) Attaching Shank with Union.
- (T) Water Tube.

How to Attach and Use.—Uncouple shank (R) from tube (C) and screw same into feed pipe from pump or heater, also using bracket (H) if preferred. Then couple (R) to tube (C) as before. Now close valve (NM), remove filling plug (B) and fill chamber (A) with good Emerald oil. Open valve (NM) one turn to equalize pressure, then open wide and regulate feed drop (D) to suit.

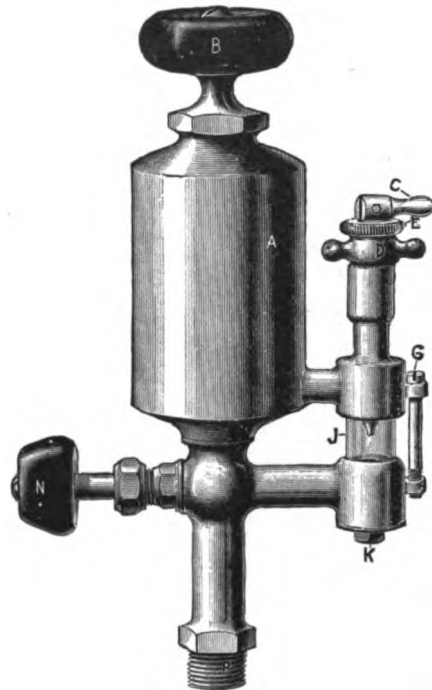
Description.—Since the method of feeding crude oil into boilers for preventing scale has come into use, an efficient sight feeder for supplying the oil has been much sought for to fill this want. We now confidently offer the Powell as embodying all the desirable features of a perfect feeder. One very objectionable defect in such devices heretofore has been that, whenever the sight globe happened to break from any cause, the contents of the oil magazine and sometimes of the entire boiler would escape from the broken part. This has been remedied in the Powell Feeder by a self-closing ball valve which prevents any waste of oil or water should the glass break. This valve is placed within the attaching shank (R) as seen in sectional view of cut. Should the sight or gauge glass break, the sudden flow of water towards the fractured part causes the ball to roll into the bearing or globe seat, and thus effectually closes the passage perfectly tight. The extended shank on valve (M) is designed to keep the ball off its seat until the pressure is equalized, after which the valve is drawn back full stroke.

Tube (C) and Bonnet (G) will interchange and can be transposed to make front or rear connections, whichever is most convenient.

Capacity	1 qt.	$\frac{1}{2}$ gal.	1 gal.
Iron Body, Brass Trimmings, with Gauge Glass and Ball Check, each . . .	\$16 50	19 50	24 00
Iron Body, Brass Trimmings, without Gauge Glass or Ball Check, each . .	13 50	16 50	19 50

POWELL'S PATENT IMPROVED GAS ENGINE LUBRICATOR.**WITH PATENT SIGNAL LEVER, STOP FEED.****Plate 73.**

Lever Up.—Shows oil dropping.

**Plate 74.**

Lever Down.—Shows oil feed cut off.

We confidently recommend this Cup to all manufacturers and users of Gas, Gasoline or Air Engines as being the Perfection Lubricator of this class of motive power. In this construction we have combined our justly celebrated Signal Stop-feed devices with a novel method of packing the Sight-glass, that dispenses with the troublesome Stuffing-boxes, as in all other Lubricators.

Regulating.—The feed is regulated with Signal Lever (C) up, by the Milled Screwhead (E), under the Signal Lever. Screwing the milled head (E) up or down increases or reduces the flow. When once the desired feed rate is obtained the Screw is locked by Winged Jamb Nut (D).

Stop-feed.—The flow is started with Lever up (see left hand illustration), and can be instantly stopped by turning the Lever down, as shown in right hand illustration, without disturbing the regulation. Thus the cup can be set for an indefinite period, doing away entirely with the constant fussing required by all other Lubricators.

Capacity	1½ pt.	¾ pt.	½ pt.	⅓ pt.	¼ pt.	1 pt.	1 qt.
Size Attach. Shank Pipe Thread . .	⅜	⅜	⅜	⅜	½	½	¾ in.
Brass Finish, Bronze Trimmings . .	\$3 50	4 00	5 00	6 00	8 00	10 00	13 50
Finished and Plated	4 20	5 00	6 00	7 25	9 50	12 00	16 00

THE SWIFT LUBRICATOR.

THE SWIFT DOUBLE CONNECTION AUTOMATIC SIGHT-FEED LUBRICATOR.

CLASS F

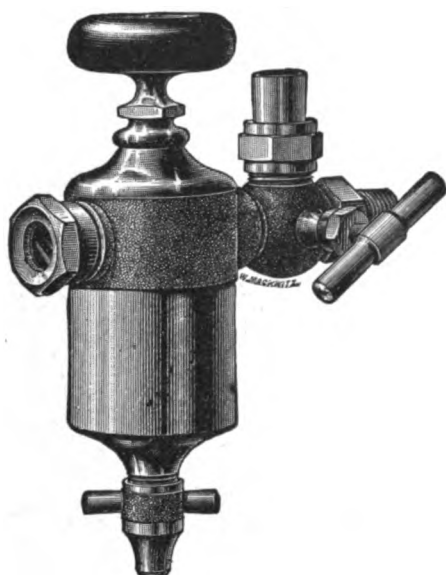


Plate 75.

THE SWIFT SINGLE CONNECTION SIGHT- FEED LUBRICATOR.

FOR TRACTION AND PORTABLE ENGINES,
STEAM PUMPS, ETC.

STYLE F.

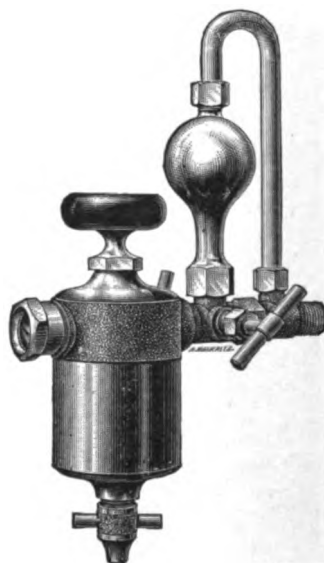


Plate 76.

LIST PRICE ON PLATE 75.

Capacity	Brass Finish	Nickel- plated	For Engine Cylinder	Amount of Oil generally used per minute
$\frac{1}{4}$ pt	\$10 00	12 00	up to 5 in.	1 to 3 drops.
$\frac{1}{2}$ pt	12 00	14 00	5 to 8 in.	2 to 4 drops.
$\frac{3}{4}$ pt	16 00	20 00	8 to 12 in.	4 to 8 drops.
1 pt	22 00	26 00	12 to 20 in.	5 to 8 drops.
1 qt	34 00	40 00	20 to 30 in.	7 to 10 drops.

THE SWIFT SINGLE CONNECTION SIGHT-FEED LUBRICATOR—PLATE 76.

The smaller sizes of these Lubricators were designed for use on Portable and Traction Engines, where it is desirable to attach with only one connection to steam pipe, and the larger cups for use on Marine and Stationary Engines, where in certain cases there is not room, or a proper chance, to attach a double connection Lubricator.

The body of the Lubricator is all cast in one piece so there are no joints for leakage, and every cup is tested on steam pipe before shipment, and warranted in the most positive terms to give the highest satisfaction in every particular, when properly attached and operated.

These Lubricators will feed any oil, no matter how heavy, and the feed will not chill in zero weather in the most exposed position. The Cup is also provided with an Index, which notifies engineer when Cup needs refilling.

The above points are found in no other Traction Engine Lubricator on the market, making our Cup unequalled for this purpose.

Capacity.	$\frac{1}{4}$ pt.	$\frac{1}{2}$ pt.	$\frac{3}{4}$ pt.	1 pt.	1 qt.
Brass Finish, each	\$10 00	12 00	16 00	22 00	34 00
Nickel-plated, each	12 00	14 00	20 00	26 00	40 00

DREYFUS' SELF-ACTING LUBRICATOR.

FOR STEAM CHESTS AND CYLINDERS OF ALL KINDS AND SIZES.

PLAIN, WITHOUT YOKE.



Plate 77.

INTERIOR VIEW.

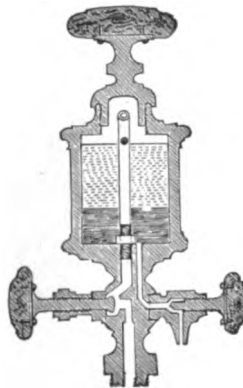


Plate 78.

WITH YOKE.

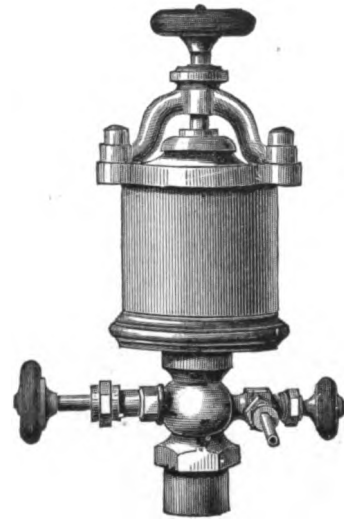


Plate 79.

Size	1	1½	2	2½	3	3½	4	5	6	7 in.
Capacity	1½	1¾	2	2½	3	4	5	6	7	8 pts.
Plain, each . . .	\$3 00	4 50	6 00	8 00	10 00	13 00	16 00	20 00	24 00	30 00
With Yoke, each . .	..	..	..	..	16 00	20 00	24 00	33 00	42 00	54 00

Screw the Cup on the top of the Steam Chest, or on the Steam Pipe.

Fill it with oil or melted tallow up to the Side Holes of the Inside Tube, then open the Valve about one quarter, and it is ready for use.

While the Engine is in motion, the Steam passes up the Tube to the upper part of the Cup, where it condenses, and the water so produced being heavier than the oil, sinks to the bottom, and lifts an equal amount of the lubricant to the top, causing it to overflow through the Side Hole near the top of the Tube to the parts where the lubrication is required.

At the end of the day, or when the oil or tallow is exhausted, water, acids and other impurities which remain, should be drawn off by the Waste Cock, and the Cup refilled with the lubricant.

LUNKENHEIMER'S JUNIOR SINGLE CONNECTION SIGHT-FEED LUBRICATOR.

FOR TRACTION ENGINES, AIR-BRAKE PUMPS, ETC.

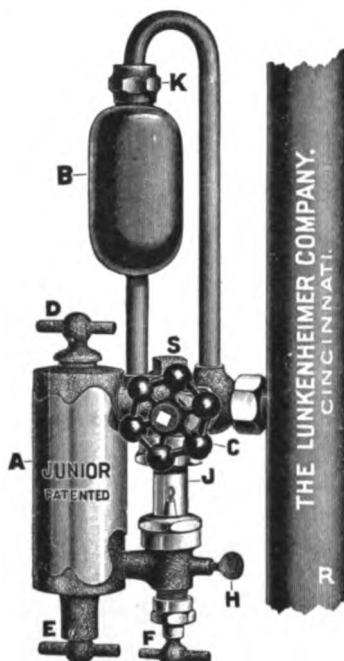


Plate 80.

Description.—(A) Oil Reservoir. (B) Condensing Chamber. (C) Steam Valve. (D) Filling Plug. (E) Drain Valve. (F) Oil Regulating Valve. (H) Valve for draining Sight-Feed Glass. (S) Plug to replace or cleanse glass.

The Junior has been designed to meet the demand for a simple, reliable and inexpensive single connection sight-feed lubricator for small engines, portables, steam pumps and locomotive air-brakes. It has but two valves—steam valve (C) and oil regulating valve (F). The sight-feed principle is that of oil drops passing up through water in a glass tube. It is partly finished and very ornamental.

The Junior must be attached to steam pipe, preferably on boiler side of throttle. The working of the cup is not affected by turning steam on or off.

Directions.—To attach—unscrew union, insert square end of wrench (sent with every cup) in square hole of tail piece of union, and screw same to steam pipe. To fill and operate—close valves (C) and (F), drain cup at (E) and fill full with oil. Then open valve (C) slowly, and when glass tube has filled with water, regulate oil drops at F.

Use good cylinder oil and feed about four drops per minute.

While cup is working leave valve (C) full open, unless pulsation interferes with oil drops, in which case regulate to suit. In attaching, see that hole in steam pipe is tapped straight allowing shank to stand exactly horizontal. To clean glass tube, remove plug (S). Keep stuffing boxes tight, as leakage prevents perfect working of cup.

Size	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1 pt.
Shank, Pipe Thread	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$ in.
Partly Finished, each	\$ 7 00	8 00	10 00	14 00
All Finished	8 50	10 00	12 00	16 00
All Finished and Nickel-Plated, each	10 00	11 50	13 50	18 00

$\frac{1}{4}$ and $\frac{1}{2}$ pint sizes are also made with $\frac{1}{2}$ inch pipe shank, but will be sent as above ($\frac{3}{8}$ inch) unless specially ordered.

CRESCENT SIGHT UP-FEED LUBRICATOR.

SINGLE CONNECTION.

FOR SMALL ENGINES, STEAM PUMPS, ETC. WITH INTER-
CHANGEABLE STEAM PIPE ATTACHMENTS.



Plate 81.

This view shows side connections.

DESCRIPTION.

- (A) Oil Reservoir.
- (B) Filling Cap.
- (C) Valve to regulate oil drops.
- (D) Ejector Valve.
- (E) Packing Nuts.
- (F) Drain Valve to draw off condensed water before refilling.
- (H) Condenser Pipe.
- (J) Sight Feed Glass.
- (K) Removable Cage to insert glass.
- (M) Condensing Chamber.
- (N) Valve to regulate water from Condenser.
- (V) Blow-off Valve to clean Sight-feed Glass.
- (R) Attaching Nipple.
- (P) Transposing Plug.

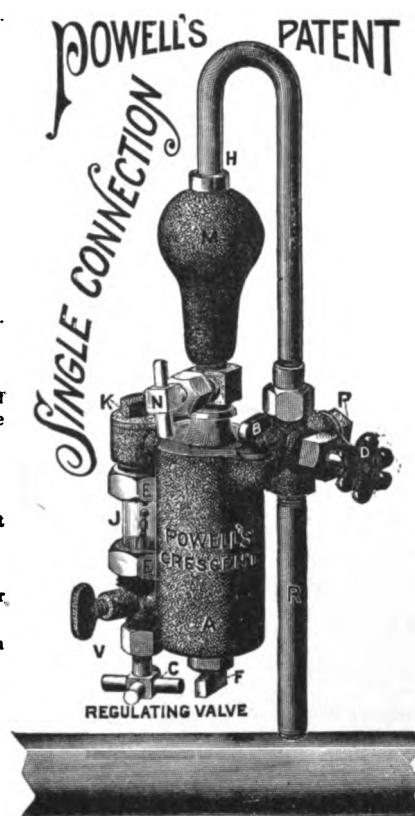


Plate 82.

This view shows bottom connections.

This Lubricator is constructed to attach either to a vertical steam pipe at the side, as shown in Plate 81, or at the bottom to a horizontal pipe, Plate 82, or directly on to the steam chest by simply transposing the Plug (P) and Nipple (R). This will be found of great convenience in many cases.

Capacity	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	1 pt.
Size of Attaching Shank, Pipe Thread	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$ in.
Bronze Finish	\$3 75	4 00	4 25	5 25	7 50
Size of Glass	$\frac{3}{8} \times 2$	$\frac{3}{4} \times 2\frac{1}{2}$	$\frac{3}{4} \times 2\frac{1}{2}$	$\frac{3}{4} \times 2\frac{1}{2}$	$\frac{3}{4} \times 3$

All Lubricators tested and warranted satisfactory.

We carry in stock only bronze finish. Polished, and polished and plated to order at special prices.

THE DETROIT.

SINGLE CONNECTION LUBRICATOR FOR TRACTION ENGINES, STEAM PUMPS, ETC.

STYLE O.

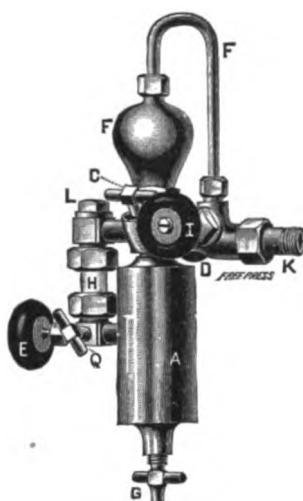


Plate 83.

Description.—(A) Oil Reservoir. (C) Filler Plug. (D) Water Feed Valve. (E) Regulating Valve. (F) Condensing Chamber. (G) Drain Valve. (H) Sight-Feed Valve. (L) Plug to Insert Glass. (K) Connection to Steam Pipe or Steam Chest. (Q) Drain Valve for Sight-Feed Glass.

This Lubricator is designed for use on Traction Engines, where it is desirable to discharge the oil either into steam pipe below the throttle or into steam chest or cylinder. Its construction is such that the oil cannot be syphoned out and a regular and steady feed is obtained.

Size	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$ pt.
Brass Finish, each	\$15 00	17 00	20 00
Nickel Finish, each	18 00	20 00	23 00
Rough Finish, each	14 00	16 00	19 00

Size of Glass—Sight Feed, $\frac{3}{4} \times 2\frac{1}{8}$.

THE DETROIT

IMPROVED STANDARD STATIONARY ENGINE LUBRICATOR

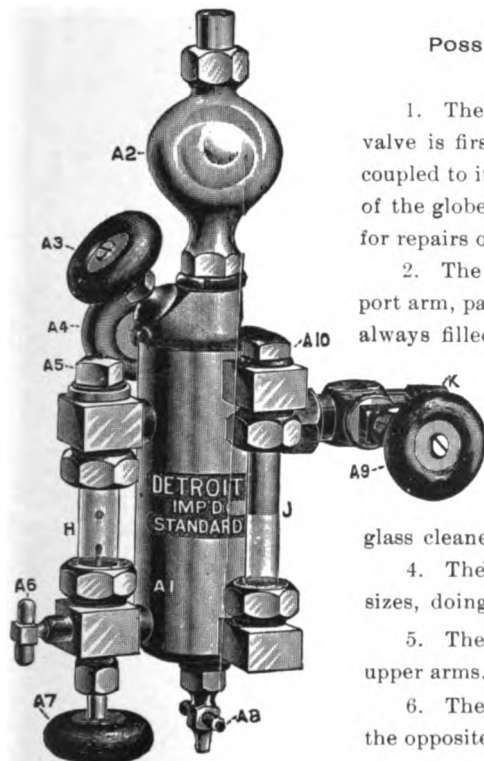


Plate 84.

POSSESSES THE FOLLOWING IMPORTANT IMPROVEMENTS:

1. The support arm is in two parts. The part containing the globe valve is first screwed into the steam pipe, and the Lubricator is then coupled to it. This makes the attachment very easy, and, on account of the globe valve, the Lubricator proper can be removed at any time, for repairs or otherwise, without letting down steam.
2. The heating passage from the upper sight-feed arm to the support arm, passes directly through the body of the Lubricator, and being always filled with steam, it keeps the oil constantly warm and in a thoroughly liquid condition. This Lubricator is particularly well adapted for feeding heavy oils, tallow or beeswax.
3. There is a drain stem under the sight-feed glass, which allows the water to be drained out and the glass cleaned at any time.
4. The oil is poured directly into the body in the pint and larger sizes, doing away with the necessity of a vent.
5. The sight-feed and gauge glasses are inserted through the upper arms.
6. The sight-feed glass and the valve regulating the feed, are on the opposite side from the steam pipe.

Valve in support arm should be in horizontal position as shown in cut when Lubricator is attached to steam pipe.

Description.—(A 1) Body or Oil Reservoir. (A 2) Condenser. (A 3) Filler Plug. (A 4) Water Feed Valve Stem. (A 5) Plug for inserting Sight-feed Glass. (A 6) Sight-feed Glass Drain Stem. (A 7) Sight-feed Regulating Valve Stem. (A 8) Drain Valve. (A 9) Globe Valve in Support Arm. (A 10) Plug for inserting Gauge Glass. (H) Sight-feed Glass. (J) Gauge Glass. (K) Connection to Steam Pipe.

Size	$\frac{1}{2}$ pt.	$\frac{1}{2}$ pt.	1 pt.	1 qt.	$\frac{1}{2}$ gal.	1 gal.
For Cylinder . . .	Under 10 in.	10 to 12 in.	12 to 18 in.	18 to 30 in.	30 in. and over.	
Brass Finish . . .	\$17 00	22 00	30 00	45 00	60 00	75 00
Nickel-plated . . .	20 00	25 00	35 00	50 00	65 00	80 00

SIZES OF GLASSES USED.

Sight-feed	$\frac{5}{8} \times 2$	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3\frac{1}{4}$	$\frac{3}{4} \times 3\frac{1}{4}$	$\frac{3}{4} \times 3\frac{1}{4}$
Gauge	$\frac{5}{8} \times 2$	$\frac{5}{8} \times 3\frac{1}{4}$	$\frac{5}{8} \times 4\frac{1}{8}$	$\frac{5}{8} \times 4\frac{1}{8}$	$\frac{5}{8} \times 6\frac{3}{4}$	$\frac{5}{8} \times 9\frac{3}{4}$

Write for prices. The above list subject to liberal discount. Over 200,000 of these Lubricators in actual use.

When ordering repairs give number of Lubricator.

LUNKENHEIMER'S IMPROVED SENIOR SIGHT-FEED LUBRICATOR.

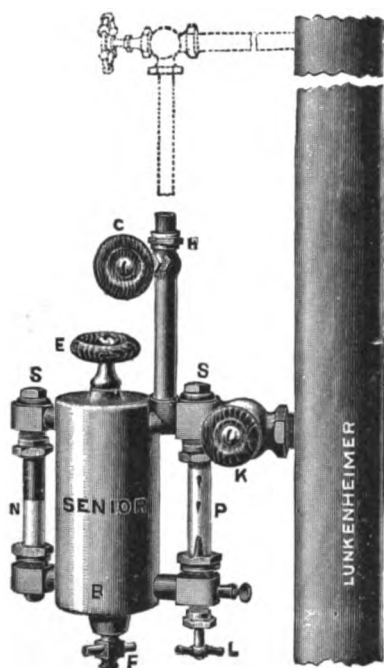


Plate 85.

DESCRIPTION.

- (B) Oil Reservoir.
 - (C) Upper Valve.
 - (E) Filling Plug.
 - (F) Drain Valve.
 - (H) Union to connect Condenser Pipe and Valve.
 - (K) Discharge Valve.
 - (L) Valve for regulating flow of oil.
 - (N) Indicator Glass.
 - (P) Sight-feed Glass.
- Valve to drain or blow out Sight-feed Glass (P).

SPECIAL FEATURES AND ADVANTAGES.

- No Condensing Bulb or Chamber to freeze and burst.
- Filling Plug on top of Oil Chamber.
- Plug (S) to facilitate replacing and cleansing of Glasses.
- Vent to blow out Sight-feed Glass (P).
- Shanks on $\frac{1}{2}$ and $\frac{1}{4}$ pint sizes threaded for $\frac{3}{8}$ inch pipe instead of $\frac{1}{2}$ inch, consequently can be easily attached to small steam pipes.

DIRECTIONS FOR CONNECTING AND OPERATING THE SENIOR.

Drill and tap Steam Pipe above the Throttle Valve to receive Oil Discharge Shank, and higher up for $\frac{1}{4}$ inch pipe thread for Condenser Pipe and Angle Valve.

To operate, close valves (C), (L) and (K).

Drain the Lubricator by opening valve (F). Close valve (F) and fill (FULL) with oil at (E).

After filling, open valve (K) SLOWLY, and wait until Sight-feed Glass (P) has filled with water by condensation, then open valve (C) and regulate the oil drops with valve (L).

After the first filling with oil, valve (K) need not be closed; as long as glass tube (P) is full of clear water it is only necessary to close valves (C) and (L) to refill.

The bottom Sight-feed Glass fitting is provided with a Drain Valve for blowing out or draining Sight-feed Glass.

Indicator Glass (N) shows the quantity of oil in the Oil Reservoir.

If Indicator Glass (N), or Sight-feed Glass (P), break, they can be replaced by unscrewing Plugs (S), and slipping glasses through from the top. This feature in construction of the Lubricator also facilitates cleansing the glasses.

All Lubricators are neatly packed in wooden boxes with sliding lids.

Size	$\frac{1}{3}$ Pt.	$\frac{1}{2}$ Pt.	$\frac{3}{4}$ Pt.	1 Pt.	1 $\frac{1}{2}$ Pt.	1 Qt.	$\frac{1}{2}$ Gal.	1 Gal.
Suitable for Engine Cylinders	Up to 6 inches	6 to 10 inches	10 to 14 inches	14 to 18 inches	18 to 24 inches	24 to 30 inches	From 30 up	
Shanks, Threaded, Pipe Thread	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ in.
Finished Brass, each	\$15 00	17 00	20 00	22 00	25 00	28 00	38 00	60 00
Nickel-plated, each	17 00	19 00	22 50	25 00	28 50	32 00	43 00	65 00
Condenser Connections, Brass Tubing and Angle Valve, each	70	80	1 00	1 20	1 40	1 50	1 60	1 70
Condenser Connections, Brass Tubing and Angle Valve, Nickel-plated, each	80	90	1 15	1 40	1 60	1 70	1 80	2 00
Length of Cond. Pipes necessary	18	24	30	36	42	48	60	72 in.

Lubricators are sent without Condenser Pipes and Angle Valve, unless ordered otherwise.

STAR SIGHT UP-FEED LUBRICATOR.**DOUBLE CONNECTION.****Plate 86.**

Please note change made in the construction of our Star Class (A) Sight Feed Lubricator. Instead of the Ejector Valve (D) being over the Sight Glass (J), we have placed it in the Attaching Shank (R), where it operates exactly as formerly, and besides saves the Extra Valve usually placed between the Lubricator and Steam Pipe. An alteration, we are confident, that will meet the approval of all engineers.

Capacity	Finished	Nickel-plated	Size of Shank	Suitable for Cylinders	Size of Sight Glass	Size of Index Glass
$\frac{1}{3}$ pt.	\$ 5 60	6 25	$\frac{3}{8}$ in.	Up to 8 in.	$\frac{3}{4} \times 2\frac{1}{8}$	$\frac{3}{4} \times 2\frac{1}{8}$
$\frac{1}{2}$ pt.	7 00	7 50	$\frac{1}{2}$ in.	8 to 10 in.	$\frac{3}{4} \times 2\frac{1}{8}$	$\frac{3}{4} \times 2\frac{1}{8}$
1 pt.	8 75	9 50	$\frac{1}{2}$ in.	10 to 18 in.	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 3$
1 qt.	11 25	12 50	$\frac{1}{2}$ in.	18 to 30 in.	$\frac{3}{4} \times 3$	$\frac{3}{4} \times 4$
$\frac{1}{2}$ gal.	16 25	17 50	$\frac{3}{4}$ in.	30 to 75 in.	$\frac{3}{4} \times 3\frac{1}{4}$	$\frac{3}{4} \times 6\frac{3}{4}$
1 gal.	26 00	33 00	1 in.	75 and over	$\frac{3}{4} \times 3\frac{1}{4}$	$\frac{3}{4} \times 6\frac{3}{4}$

DESCRIPTION.

- | | |
|---|---|
| (A) Oil Reservoir. | (JJ) Sight Feed and Index Glasses. |
| (B) Filling Cap. | (K) Removing Cage to Insert Glass. |
| (C) Valve to Regulate Oil Drops. | (M) Condensing Chamber. |
| (D) Ejector Valve. | (N) Valve to regulate water from Condenser. |
| (E) Packing Nuts. | (V) Blow-off Valve to clean Sight Feed Glass. |
| (F) Drain Valve to Draw off Condensed water before refilling. | (R) Attaching Shank. |
| (H) Coupling for Condenser Pipe. | |

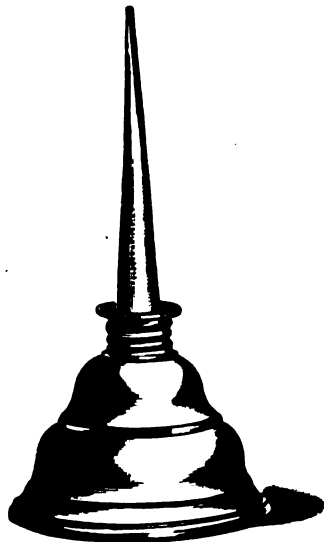
POWELL'S PATENT IMPROVED TRIPLE DYNAMO SIGHT FEED OIL CUP.

MADE WITH ANY DESIRED NUMBER OF SIGHT ARMS.

If Index Glass (J) gets broken, Cut-off Valve (F) prevents loss of oil while machine is running until Glass is replaced. The Side Arms are adjustable to suit length of box. For oiling the long bearings of dynamos or engines, this Oiler is as near perfection as it can be made.

Capacity	1 qt.	$\frac{1}{2}$ gal.	1 gal.
Center Shank, Pipe Thread	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$ in.
Finished, each	\$26 00	36 00	50 00
Nickel-plated, each	30 00	42 00	58 00

**Plate 87.**

CHASE'S MACHINE OILER.**Plate 88.****CHASE'S ZINC OILERS.****WITH TIN BOTTOMS.**

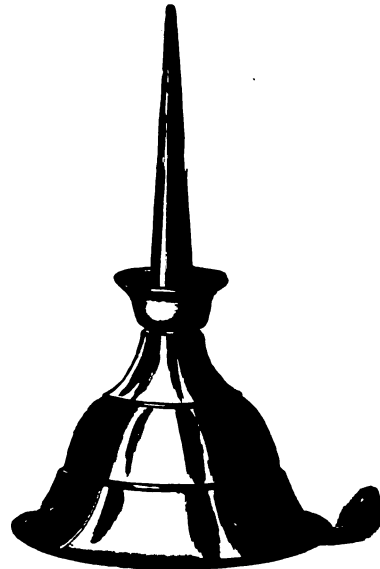
No. 00, per doz.	\$1 00
No. 0, per doz.	1 25
No. 1, per doz.	1 50
No. 1½, per doz.	1 75
No. 2, per doz.	2 00
No. 3, per doz.	2 25
No. 4, per doz.	2 75
No. 5, per doz.	3 50
No. 6, per doz.	4 50

CHASE'S ZINC OILERS.**WITH BRASS BOTTOMS.**

No. 00, per doz.	\$1 25
No. 0, per doz.	1 50
No. 1, per doz.	1 75
No. 1½, per doz.	2 00
No. 2, per doz.	2 50
No. 3, per doz.	3 00
No. 4, per doz.	3 50
No. 5, per doz.	4 50
No. 6, per doz.	5 50

CHASE'S BRASS OILERS.

No. 0, per doz.	\$2 25
No. 1, per doz.	2 50
No. 1½, per doz.	3 00
No. 2, per doz.	3 50
No. 3, per doz.	4 00
No. 4, per doz.	4 75
No. 5, per doz.	6 00
No. 6, per doz.	7 50

PARAGON OILER.**Plate 89.****PARAGON ZINC OILERS.****WITH TIN BOTTOMS.**

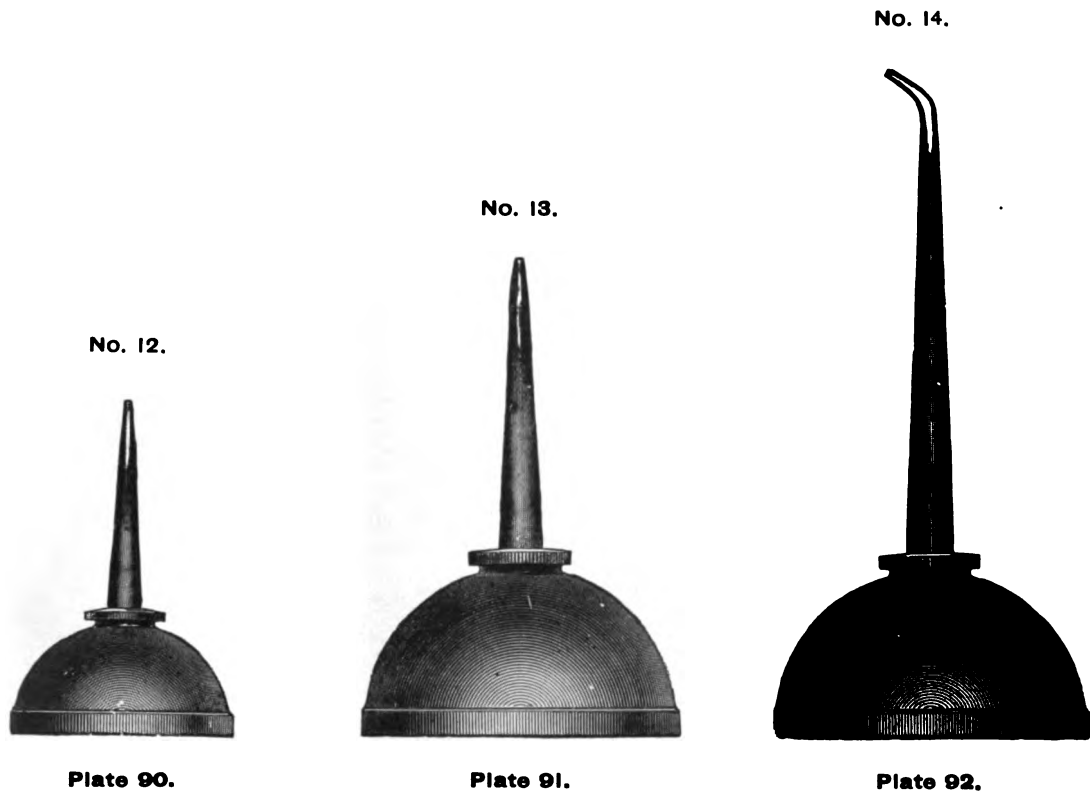
No. 0, per doz.	\$2 00
No. 1, per doz.	2 25
No. 1½, per doz.	2 50
No. 2, per doz.	3 00
No. 3, per doz.	3 25
No. 4, per doz.	3 75
No. 5, per doz.	4 50
No. 6, per doz.	5 50

PARAGON ZINC OILERS.**WITH BRASS BOTTOMS.**

No. 0, per doz.	\$2 25
No. 1, per doz.	2 50
No. 1½, per doz.	3 00
No. 2, per doz.	3 50
No. 3, per doz.	4 00
No. 4, per doz.	4 50
No. 5, per doz.	5 50
No. 6, per doz.	6 50

PARAGON BRASS OILERS.

No. 0, per doz.	\$3 00
No. 1, per doz.	3 50
No. 1½, per doz.	4 00
No. 2, per doz.	4 50
No. 3, per doz.	5 25
No. 4, per doz.	6 00
No. 5, per doz.	7 00
No. 6, per doz.	8 50

DRAPER OILERS.**STEEL.**

No. 12, Steel Oiler, $2\frac{3}{4}$ inch diameter, $2\frac{1}{2}$ inch Nozzle, per doz	\$4 50
No. 13, Steel Oiler, $3\frac{3}{8}$ inch diameter, 3 inch Nozzle, per doz	5 50
No. 14, Steel Oiler, $3\frac{3}{8}$ inch diameter, 9 inch Nozzle, per doz	6 50
No. 15, Steel Oiler, $4\frac{1}{4}$ inch diameter, 3 inch Nozzle, per doz	9 25
No. 16, Steel Oiler, $4\frac{1}{4}$ inch diameter, 9 inch Nozzle, per doz	10 50

BRASS.

No. 120, Brass Oiler, $2\frac{3}{4}$ inch diameter, $2\frac{1}{2}$ inch Nozzle, per doz	\$6 50
No. 130, Brass Oiler, $3\frac{3}{8}$ inch diameter, 3 inch Nozzle, per doz	8 00
No. 140, Brass Oiler, $3\frac{3}{8}$ inch diameter, 9 inch Nozzle, per doz	9 20
No. 150, Brass Oiler, $4\frac{1}{4}$ inch diameter, 3 inch Nozzle, per doz	12 00
No. 160, Brass Oiler, $4\frac{1}{4}$ inch diameter, 9 inch Nozzle, per doz	14 00

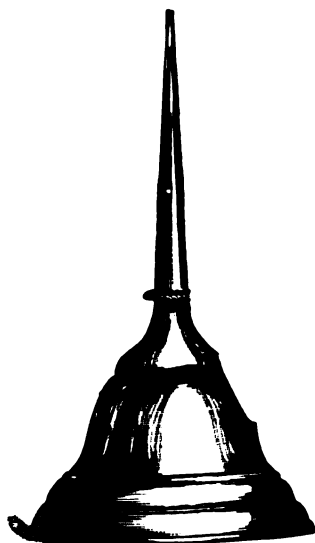


Plate 93

TIN OILER.

No. 0, per doz.	\$1 25
No. 1, per doz.	1 50
No. 2, per doz.	2 00
No. 3, per doz.	2 25
No. 4, per doz.	2 75

WITH BRASS BOTTOMS.

No. 0, per doz.	\$1 50
No. 1, per doz.	1 75
No. 2, per doz.	2 50
No. 3, per doz.	3 00
No. 4, per doz.	3 50

MALLEABLE IRON OILER.

Number	1	2	3
With Patent Elliptic Steel Spring, per doz.	\$5 00	5 50	6 00



Plate 94.

ENGINEERS' DRIP OILER.

Plate 95.

1 Pint, per doz.	\$3 75
1½ Pint, per doz.	4 25
1 Quart, per doz.	4 50

MONONGAHELA MINERS' LAMP.

Plate 96.

Miners' Lamps, in 1 doz. lots, per doz.	\$3 00
Drivers' Lamps, in 1 doz. lots, per doz.	2 25
Miners' Lamps, in not less than 6 doz. lots, per doz.	2 85
Drivers' Lamps, in not less than 6 doz. lots, per doz.	3 00

DRAPER'S ENGINEERS' FILLER.

Plate 97.

SCREW TOP.

	Per doz.
No. 19, Pint, Steel Fillers, $4\frac{1}{4}$ inch diameter, $3\frac{1}{2}$ inches high	\$14 00
No. 210, Quart, Steel Fillers, 5 inch diameter, 5 inches high	20 00
No. 190, $1\frac{1}{2}$ Pint, Brass Fillers, $4\frac{1}{4}$ inch diameter, 4 inches high	22 00
No. 200, Quart, Brass Fillers, 5 inch diameter, 5 inches high	30 00

STEEL PUMP OILER.

Plate 98.

STEEL PUMP OILERS.

No. 210, Quart, Steel Pump Oiler, each	\$ 5 00
No. 220, Quart, Brass Pump Oiler, each.	5 50

STEEL RAILROAD OILERS.

No. 10, Pint Railroad Oiler, $3\frac{3}{8}$ inch diameter, 5 inches high, 12 inch nozzle, per doz.	\$14 00
No. 11, Quart Railroad Oiler, $4\frac{1}{4}$ inch diameter, 6 inches high, 18 inch nozzle, per doz	18 00

BRASS RAILROAD OILERS.

No. 17, Pint Railroad Oiler, $3\frac{3}{8}$ inch diameter, 5 inches high, 12 inch nozzle, per doz.	\$18 00
No. 18, Quart Railroad Oiler, $4\frac{1}{4}$ inch diameter, 6 inches high, 18 inch nozzle, per doz	21 00

STEEL LAMP.

Plate 99.

No. 20, Steel Jacket Lamp, $2\frac{3}{4}$ inches diameter, per doz	\$ 6 00
No. 21, Steel Jacket Lamp, $4\frac{1}{4}$ inches diameter, per doz	12 00

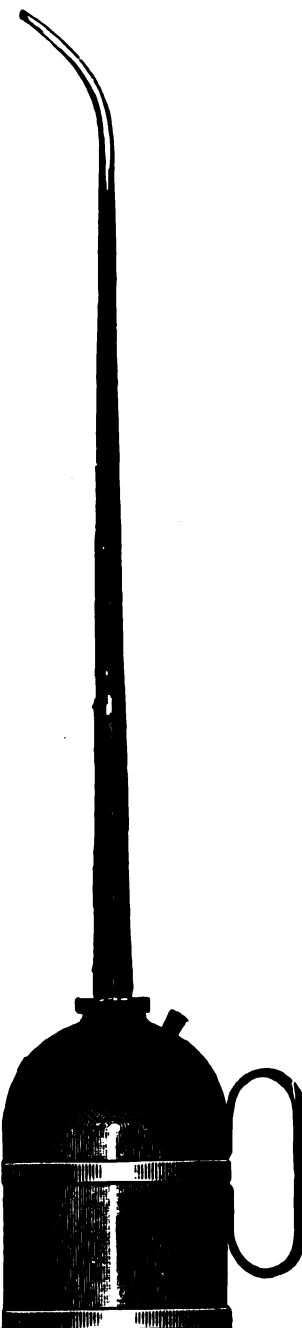
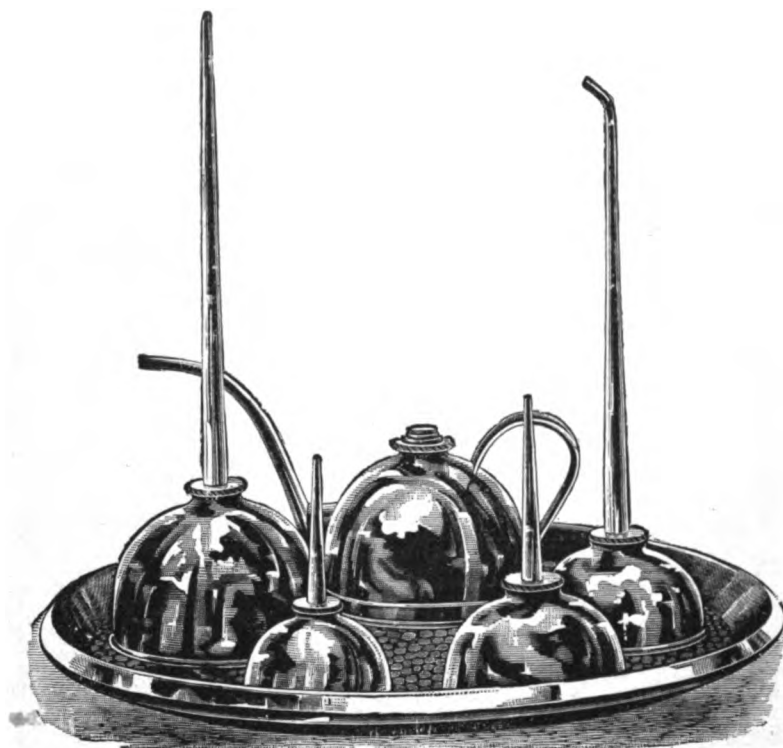
STEEL RAILROAD OILER.

Plate 100.

DRAPER'S ENGINEERS' SET.**Plate 101.****WITH HAMMERED TRAYS.**

No. 30, five pieces, Brass	\$ 6 00
No. 40, six pieces, Brass	9 00
No. 50, five pieces, Nickel	8 00
No. 60, six pieces, Nickel	11 00

WITH DOUBLE-BOTTOM TRAYS.

RECESSED FOR EACH PIECE.

No. 70, five pieces, Brass	\$ 7 00
No. 80, six pieces, Brass	10 00
No. 90, five pieces, Nickel	9 00
No. 100, six pieces, Nickel	12 00

BICYCLE OILER.**FRONT VIEW.****SIDE VIEW.****Plate 102.**

The above engravings show the actual size of the Oiler.

This Oiler is intended for Sewing Machines, Bicycles, Roller Skates and other uses. It is provided with a screw-top on end of spout, which makes it oil-tight when carried in the pocket or in any position in which it may be placed.

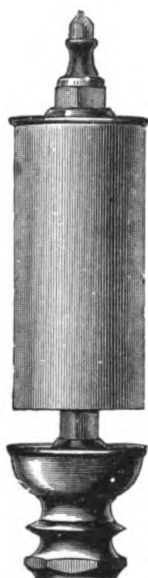
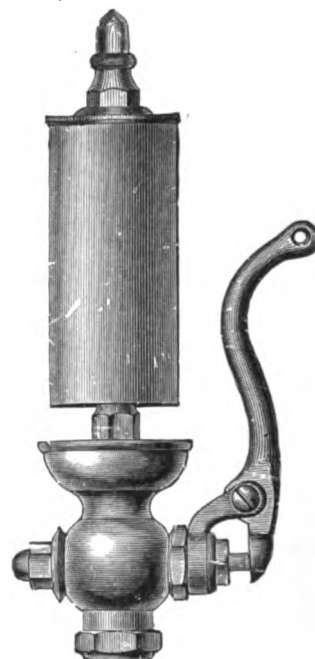
		Per Gross
Tin	Stock No. 240	\$20 00
Brass	" 241	25 00
Tin, Nickel-plated	" 242	25 00
Brass, Nickel-plated	" 243	30 00
Brass, Fancy	" 244	30 00
Brass, Fancy, Nickel-plated	" 245	30 00

STEAM WHISTLES.**LONG BELL.****ALL BRASS.****WITHOUT VALVE.**

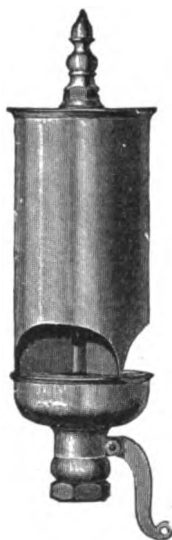
Diameter of Bell . .	1	1½	1¾	2	2½	3 in.
Size for Iron Pipe . .	¾	¾	¾	¾	¾	1 in.
Each	\$2 20	2 75	3 00	4 35	5 25	7 25
Diameter of Bell . .	3¾	4	5	6	8 in.	
Size for Iron Pipe . .	1	1½	1¾	2	2½ in.	
Each	\$9 50	12 00	19 00	24 00	70 00	

WITH VALVE.

Diameter of Bell .	1	1½	1¾	2	2½	3 in.
Size for Iron Pipe .	¾	¾	¾	¾	¾	1 in.
Each	\$ 3 10	3 75	4 00	5 50	6 50	8 50
Diameter of Bell .	3¾	4	5	6	8 in.	
Size for Iron Pipe .	1	1½	1¾	2	2½ in.	
Each	\$11 50	15 00	22 50	33 00	95 00	

**Plate 103.****Plate 104.****WHISTLE VALVE.****STEAM METAL.**

Size	¾	¾	1	1½	1¾	2	2½	3 in.
Rough, each	\$2 50	3 00	3 50	5 00	6 00	9 00	18 00	27 00
Iron, each							15 00	18 00

SINGLE BELL CHIME STEAM WHISTLE.**No. 2.****No. 3.****No. 1.****Plate 105.****Plate 106.****Plate 107.**

Diameter of Bell	2	3	4	5	6	8	10	12 in.
Size, Steam Pipe	¾	¾	1	1½	1¾	2	2½	3 in.
No. 1, without Valve	\$5 00	8 00	14 00	22 00	38 00	85 00	150 00	260 00
No. 2, with Upright Valve			18 00	28 00	42 00			
No. 3, with Side Valve	7 00	11 00	18 00	28 00	42 00	100 00	180 00	300 00

The peculiar merit of this Whistle consists in producing three distinct tones pitched to the first, third and fifth of the common musical scale, which harmonize and give an agreeable musical chord.

LUNKENHEIMER'S PATENT SINGLE BELL CHIME WHISTLE.

ALL BRASS, WITH ADJUST-
ABLE LEVER.

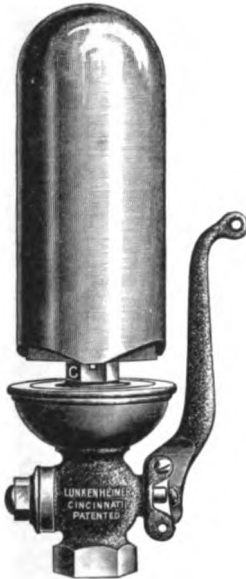


Plate 108.

ALL BRASS, WITHOUT
VALVE.



Plate 109.

LOCOMOTIVE STYLE, WITH
UPRIGHT VALVE.



Plate 110.

Our new style Single Bell Chime Whistle as seen in the illustrations above is unique and handsome in appearance, and produces harmoniously three distinct tones which blend and form a beautiful musical chord. The sounds given forth from our style of Chime Whistle, while being more acute and piercing than the common whistle, have not the harsh and disagreeable qualities of the latter, and can be heard at a greater distance. Another advantage of this style of construction is that the bell may be raised or lowered to suit varying steam pressures, a feature that is found only on whistles of our manufacture.

To Adjust the Bell—Loosen jam-nut (C) and screw the bell up or down, until the whistle blows best, then fasten the jam-nut.

Diameter of Bells	2	2½	3	3½	4	5	6	8	10 in.
Size of Pipe connection . . .	½	¾	¾	1	1¼	1½	1½	2	2½ in.
All Brass, with Adjustable Lever, each	\$10 00	13 00	16 00	22 00	28 00	44 00	60 00	145 00	235 00
All Brass, without Valve, each.	8 50	10 50	13 50	18 50	24 00	37 00	49 00	120 00	188 00
Iron Base, without Valve, each.	.....	.....	12 00	16 50	22 00	33 00	45 00	108 00	155 00
All Brass, Locom. style, each.	.....	.....	.....	.....	27 50	43 00	59 00	.....	.....

For Price List on Whistle Valves see page 48.

STEAM SIRENS.

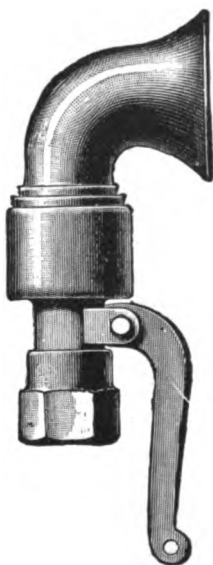


Plate 111.

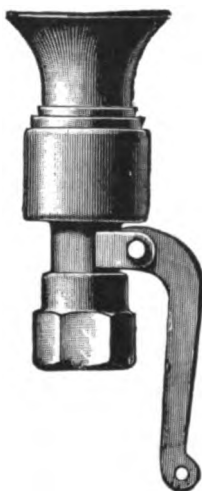


Plate 112.

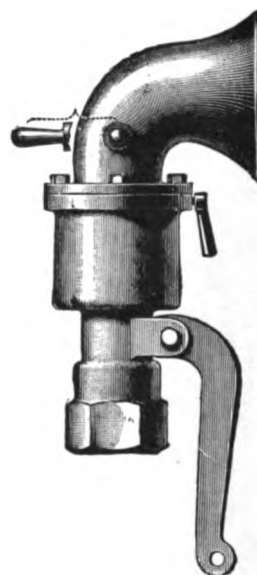


Plate 113.

These Sirens are specially constructed for use on board steamships and steamboats, and will be found to possess advantages greatly superior to any other steam sounding or signaling apparatus. The following among other advantages will be readily understood and appreciated.

They give the most intense, far-reaching, and distinctive sound yet obtained.

They cannot be over-blown, even with the highest pressure, as is the case with Bell or Organ Pipe Steam Whistle.

With the Fixed Cowl the sound is projected in a horizontal direction; the Siren may be fitted to look forward, so that the most concentrated sound will be projected in the direction of the steamer's course.

With the Movable Cowl the Siren becomes in acoustics what the electrical search-light is in optics, as the sound may be projected horizontally in any required direction.

Size. No.	Connection.	Bellmouth. Plate 112.	Fixed Cowl. Plate 111.	Movable Cowl. Plate 113.	Geared Cowl.
1	$\frac{3}{4}$ inch.	\$15 00	20 00	25 00	.....
2	1 "	22 00	27 00	32 00	.....
3	$1\frac{1}{2}$ "	40 00	45 00	50 00	60 00
4	2 "	65 00	75 00	85 00	100 00
5	$2\frac{1}{2}$ "	110 00	125 00	145 00	175 00

LUNKENHEIMER'S IMPROVED BRASS STEAM WHISTLES.

(PATENTED).

ALL BRASS, WITHOUT VALVE.

ALL BRASS, WITH ADJUSTABLE LEVER.



Plate 114.

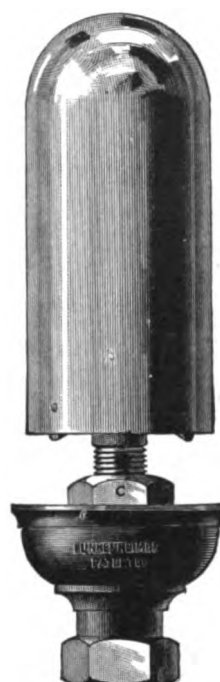


Plate 115.

These new style whistles will be found a decided improvement over the usual style with central stem, and owing to several practical advantages, simplicity and neat appearance, will no doubt meet with universal favor. The bell is dome-shaped at its upper end, and at its lower securely supported by a three-armed spider, the stem of which is adjustably screwed into the whistle base and fastened by a jam nut (E). Owing to this construction the lower edge of the bell is always exactly in line with the slot in the base through which the steam escapes, therefore insuring best results and a perfectly clear and loud tone. The bell is raised or lowered to suit steam pressure by screwing it up or down, and when properly set is fastened by jam nut (E). All whistles are made of best material and fully warranted.

Diameter of Bells	1	1¼	1½	2	2½	3 in.
Size of Pipe Connection	¼	¼	⅜	½	¾	¾ in.
Brass Whistles, with Adjus. Lever, each	\$3 50	3 75	4 00	4 75	6 50	8 00
Brass Whistles, without Valve, each	1 70	2 00	2 50	3 25	4 50	6 00
Brass Whistles, without Valve, Long Bell, each . . . . .	.....	.....	.....	.....	.....	7 50
Diameter of Bells	3½	4	5	6	8	10 in.
Size of Pipe Connection	1	1¼	1½	1¾	2	2½ in.
Brass Whistles, with Adjus. Lever, each	11 00	14 00	22 00	30 00	80 00	175 00
Brass Whistles, without Valve, each	8 50	11 00	18 00	24 00	65 00	125 00
Brass Whistles, without Valve, Long Bell, each	10 25	13 50	22 00	31 00	80 00	145 00

Bells on Long Bell Whistles are about three times the diameter.

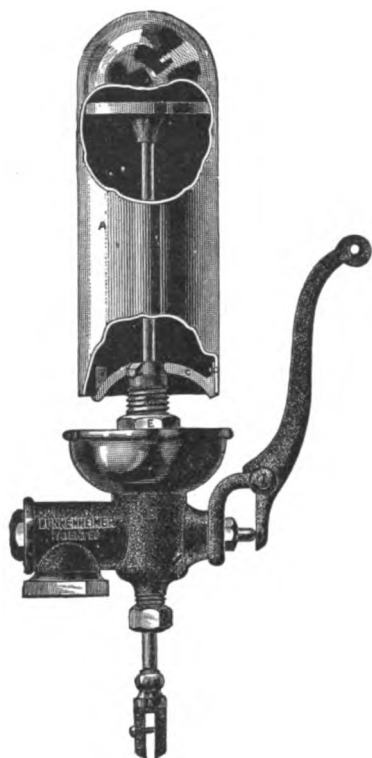


Plate 116.

LUNKENHEIMER'S IMPROVED COMBINATION OR FIRE ALARM WHISTLE.

COMPLETE, WITH VALVE.

(PATENTED.)

This Whistle is designed to answer both the purposes of an ordinary whistle as well as that of a Fire Alarm. It is provided with a piston that can be moved up or down within the bell or tube, thus changing the interior length of same and consequently, also the sound of the whistle. When the piston is not operated the whistle gives but one sound, like any ordinary whistle, but when pulled up and down, a howling, penetrating noise is produced. When placed above the roof of a building an extension rod should be coupled to the piston stem and a rope or wire to the whistle valve lever. The bell is dome-shaped at its upper end and at its lower securely supported by a three-armed spider, the stem of which is adjustably screwed into the whistle base and fastened by a jam-nut (E). Owing to this construction the lower edge of the bell is always exactly in line with the slot in the base through which the steam escapes, therefore insuring best results and a perfect, clear and loud tone. The bell is raised or lowered to suit steam pressure by screwing it up or down, and when properly set, is fastened by jam-nut (E). All our whistles are made of best material and fully warranted.

Diameter of Bells	2½	3½	5	8 in.
Size Pipe Connection	¾	1	1½	2 in.
Price, with Whistle Valve complete, each	\$15 00	20 00	23 00	55 00

LUNKENHEIMER'S IMPROVED THREE-WHISTLE CHIME.

(PATENTED.)

THREE-WHISTLE CHIMES, CORRECTLY TUNED.

No. 1, Composed of one each 1½, 2 and 2½-inch Whistles	\$ 22 00
Size Pipe Connection, 1 inch.	
No. 2, Composed of one each 3½, 4 and 5-inch Whistles	40 00
Size Pipe Connection, 1½ inch.	
No. 3, Composed of one each 5, 6 and 8-inch Whistles	109 00
Size Pipe Connection, 2½ inch.	

Notice—Whistle Valves for above are extra and Chimes will be sent complete with Valve, unless otherwise ordered.

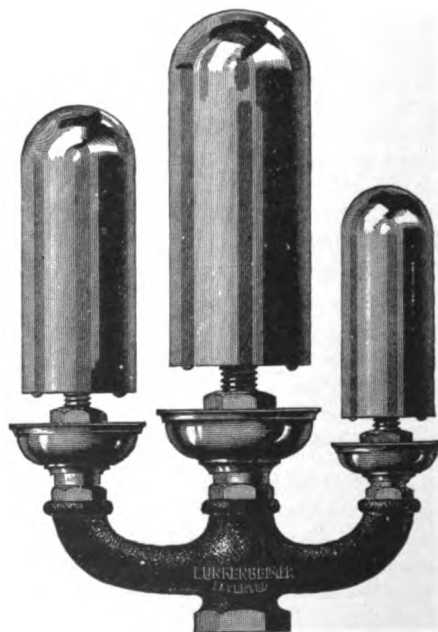
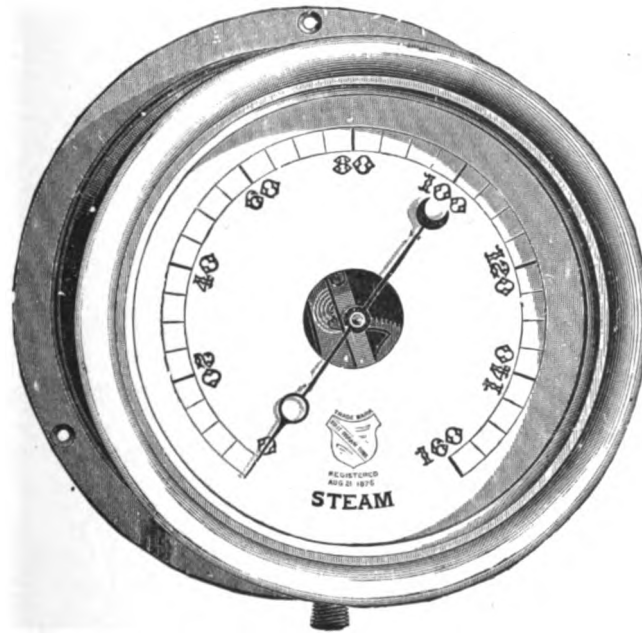


Plate 117.

ASHCROFT'S STEAM GAUGE.**SOLID DRAWN, SEAMLESS TUBE.****Plate 118.****GAUGES OF 300 POUNDS PRESSURE OR LESS.**

BRASS CASE.		IRON CASE.	
12 inch Dial	\$75 00	12 inch Dial	\$50 00
10 inch Dial	40 00	10 inch Dial	32 00
8½ inch Dial	30 00	8½ inch Dial	22 00
6¾ inch Dial	20 00	6¾ inch Dial	16 00
6 inch Dial	16 00	6 inch Dial	13 00
5½ inch Dial	12 00	5 inch Dial	8 00
4½ inch Dial	10 00	4½ inch Dial	8 00
3½ inch Dial	9 00	3½ inch Dial	7 00
3 inch Dial, or smaller	8 00	3 inch Dial, or smaller	6 00

Nickel-plating extra, at cost.

No Gauge warranted unless properly connected with Siphon.

Gauges should indicate about double the working pressure.

All Gauges are graduated by open mercury column, and warranted correct.

COMPOUND PRESSURE AND VACUUM GAUGE.

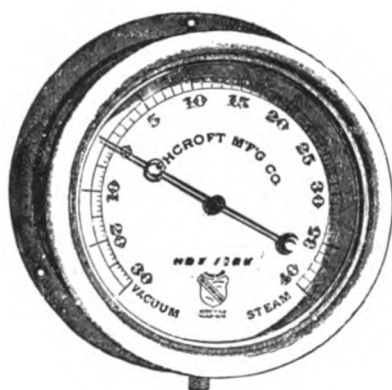


Plate 119.

SPRINGS OF SOLID DRAWN, SEAMLESS TUBE, INCLUDING COCK.

BRASS CASE.

12 inch Dial	\$80 00
10 inch Dial	50 00
8½ inch Dial	40 00
6¾ inch Dial	25 00
6 inch Dial	20 00
5½ inch Dial	16 00
4½ inch Dial	14 00
3½ inch Dial	12 00

IRON CASE, JAPANNED.

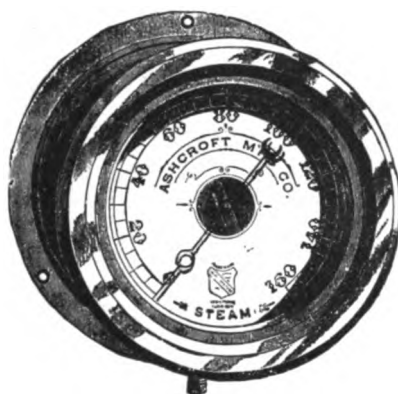
12 inch Dial	\$60 00
10 inch Dial	40 00
8½ inch Dial	30 00
6¾ inch Dial	20 00
6 inch Dial	16 00
5½ inch Dial	14 00
4½ inch Dial	12 00
3½ inch Dial	10 00

Deep Cases and Nickel-plating extra.

A Siphon must be used in connecting this Gauge.

The adoption of Compound Engines has created a demand for a Gauge showing both Pressure and Vacuum on the same Dial. These Gauges are graduated from two Mercury Columns, showing pressure and vacuum, and are warranted correct.

Pressure range from 30 inches to 60 pounds of pressure.

DEEP CASE STEAM, VACUUM AND BACK PRESSURE GAUGES.**Plate 120.**

**WITH SINGLE BOURDON SPRING OF SOLID DRAWN, SEAMLESS
TUBE, INCLUDING COCK.**

BRASS CASE.

12 inch Dial	\$80 00
10 inch Dial	44 00
8½ inch Dial	33 50
6¾ inch Dial	23 00

Nickel-plating extra.

**WITH DOUBLE BOURDON SPRING OF SOLID DRAWN, SEAMLESS
TUBE, INCLUDING COCK.**

BRASS CASE.

12 inch Dial	\$85 00
10 inch Dial	49 00
8½ inch Dial	37 50
6¾ inch Dial	25 00

Nickel-plating extra.

State in ordering if blind back or the usual connections are wanted.

These Gauges have the same movements as those described on page 54 and are mounted in cases to correspond with those of the Revolution Counters, which require the deep case to give uniformity in appearance of sets of instruments.

ASHCROFT'S HYDRAULIC GAUGE.

STEEL TUBE FOR HIGH PRESSURES.

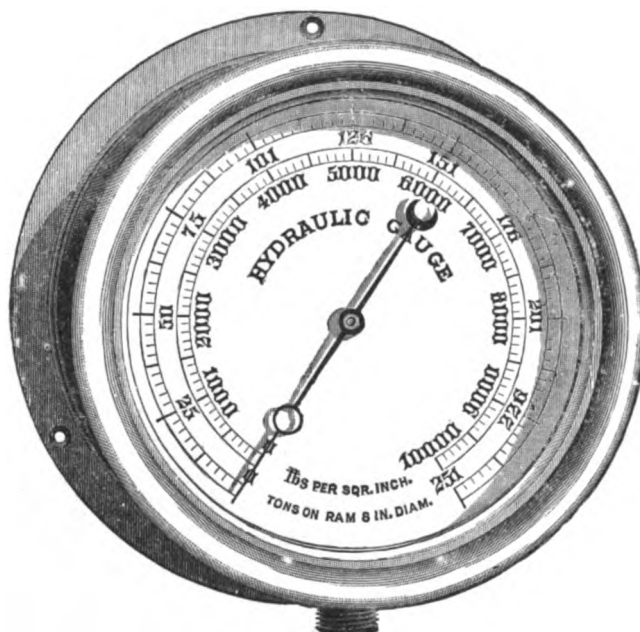


Plate 121.

BRASS CASE, INCLUDING COCKS.

12 inch Dial	\$125 00
10 inch Dial	100 00
8½ inch Dial	80 00
6¾ inch Dial	60 00
6 inch Dial	40 00

IRON CASE, BRASS RING, INCLUDING COCKS.

12 inch Dial	\$110 00
10 inch Dial	90 00
8½ inch Dial	70 00
6¾ inch Dial	50 00
6 inch Dial	35 00

Nickel-Plating extra, at cost.

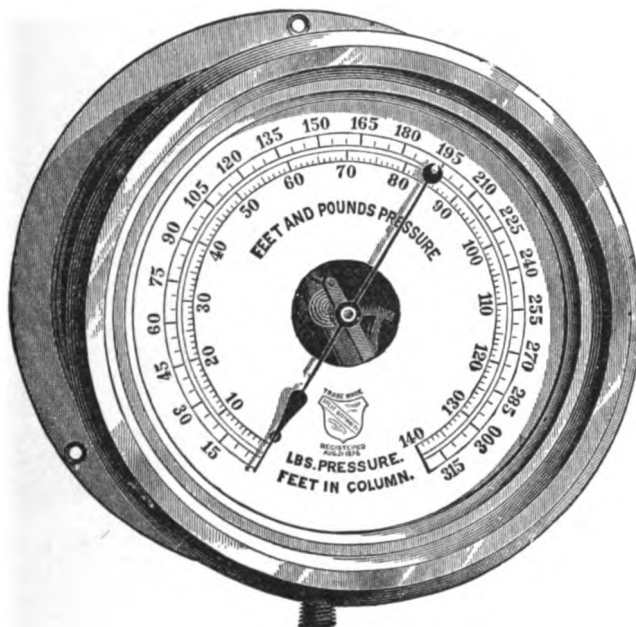
In ordering, state maximum pressure required; graduations should be one-third greater.

If Dial is to show pressure in Tons on Ram, give exact diameter of Piston.

With independent maximum pressure Registering Hand, \$5.00 extra.

In these Gauges a heavy Steel Tube, made from a solid bar, is substituted for the Seamless Brass Tube, for all pressure over 1,000 pounds to the square inch.

We warrant the indications of pressure on these Gauges to be correct according to Mr. A. H. Emery's celebrated Testing Pump at the United States Arsenal, Watertown, Mass. Higher pressures up to 20,000 pounds we have proved to be practically correct by an expensive machine built for and in use in our own shops.

ASHCROFT'S WATER PRESSURE GAUGE.**FOR WATER WORKS, PUMPING STATIONS, MINES, ETC.****SHOWING PRESSURE AND FEET IN COLUMNS.****Plate 122.**

This Gauge has two sets of graduations—one showing pounds pressure to the square inch, the other showing height in feet of water in column. It is used to show pressures developed by pumps, in mines, working against not only head, but resistance of friction and turns in pipes.

BRASS CASE, INCLUDING COCK.

12 inch Dial	\$80 00
10 inch Dial	50 00
8½ inch Dial	40 00
6¾ inch Dial	25 00
6 inch Dial	20 00
5½ inch Dial	16 00

IRON CASE, INCLUDING COCK.

12 inch Dial	\$60 00
10 inch Dial	40 00
8½ inch Dial	30 00
6¾ inch Dial	20 00
6 inch Dial	16 00
5½ inch Dial	14 00

Nickel-plating extra, at cost.

State in orders highest working pressure or feet to be recorded.

LOCOMOTIVE GAUGES.

DOUBLE BOURDON SPRING ELASTIC PACKING RING.

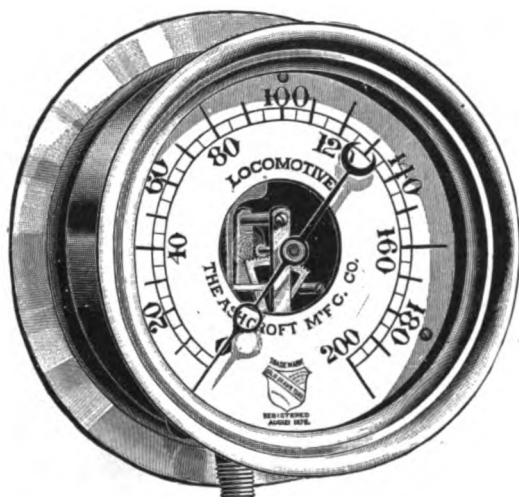


Plate 123.

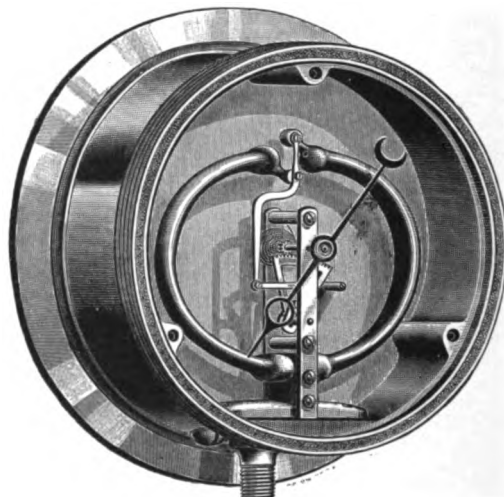


Plate 124.

PRICES INCLUDING COCK.

BRASS CASE.

12 inch Dial	\$80 00
10 inch Dial	45 00
8½ inch Dial	34 00
6¾ inch Dial	22 00
6 inch Dial	18 00
5½ inch Dial	14 00
5 inch Dial	13 00
4½ inch Dial	12 00

IRON CASE, JAPANNED.

12 inch Dial	\$55 00
10 inch Dial	37 00
8½ inch Dial	25 00
6¾ inch Dial	18 00
6 inch Dial	15 00
5½ inch Dial	12 00
5 inch Dial	11 00
4½ inch Dial	10 00

Nickel-plating extra.

AMMONIA GAUGE.

FOR AMMONIA, ACID, OR OTHER LIQUIDS OR GASES THAT MUST BE
KEPT FROM BRASS.

**Plate 125.**

TUBE SPRINGS MADE FROM HOBSON'S CHOICE STEEL.

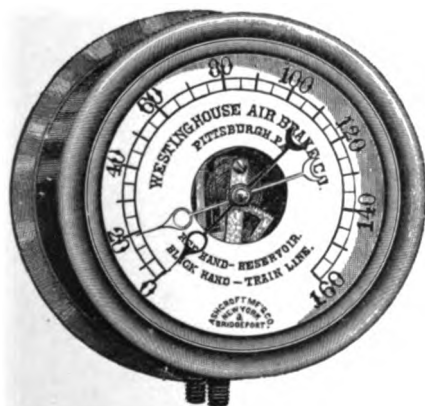
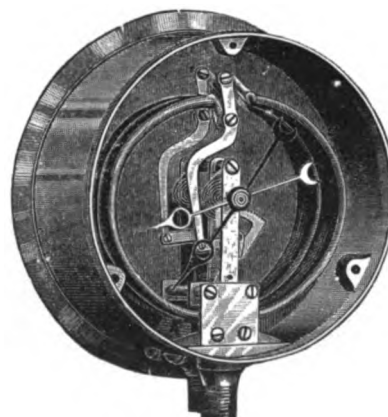
IRON CASES AND RINGS.

8½ inch Dial	\$45 00
6¾ inch Dial	40 00
6 inch Dial	35 00

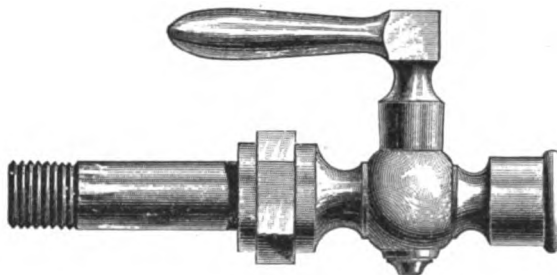
These Springs are made of a special quality of steel, and are tempered by a process, insuring uniformity, durability and correctness of indication.

In ordering, state whether a compound scale showing pressure and vacuum or pressure only is required.

If wanted with connection at back, it has to be stated in ordering.

WESTINGHOUSE DUPLEX AIR BRAKE GAUGE.**Plate 126.****Plate 127.**

5½ inch Deep Brass Case	\$20 00
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UNION STEAM GAUGE COCK.**Plate 128.**

Small Union Brass Cock, for Steam Gauge	\$1 50
Large Union Brass Cock, for Steam Gauge	2 00

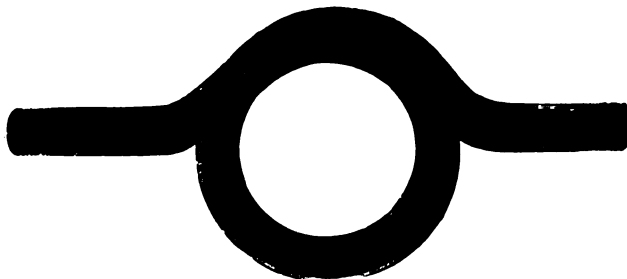
PRINDLE'S PATENT SIPHON COCKS.

ESPECIALLY ADAPTED FOR TRACTION AND PORTABLE ENGINES.

**Plate 129.****Plate 130.****Plate 131.****Plate 132.**

Straight Siphon, without Cock, Plate 131	\$1 00
Straight Siphon with Cock, Plate 130	1 50
Elbow Siphon with Cock, Plate 132	1 50
Elbow Siphon without Cock	1 25

Nickel Plating extra.

SIPHON FOR STEAM GAUGE.**Plate 133.**

Size for Iron Pipe	$\frac{1}{4}$ in.
Each	\$0 50

EDSON'S AMMONIA PRESSURE RECORDING GAUGES.

FOR RECORDING HIGH OR LOW AMMONIA PRESSURES.

Endorsed and highly recommended by The De La Vergne Refrigerating Machine Co., York Manufacturing Co., Frick Co. and American Ice Machine Co., as being indispensable in enabling the owner or Superintendent of an Ice or Refrigerating Plant to keep the same properly in hand, and giving him thorough control over it.

FOR RECORDING HIGH AMMONIA
PRESSURE.

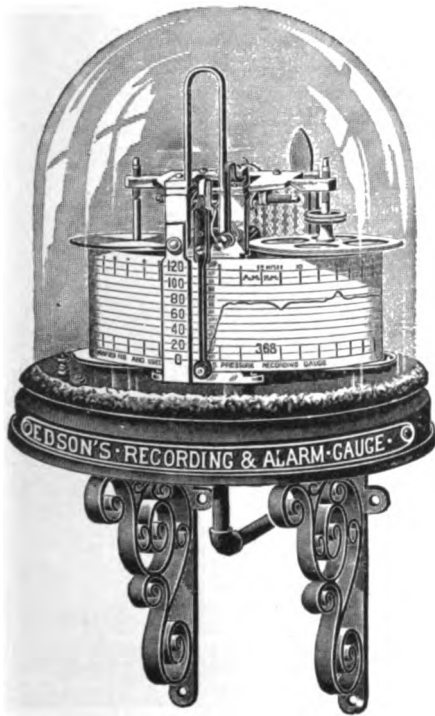


Plate 134.

Complete, with High Pressure Circuit Closer, Bell and Battery, one year's supply of Metallic-surfaced Charts, Fancy Black Iron Brackets, Special Chart Album and Flange Unions.

FOR RECORDING LOW AMMONIA
PRESSURE.

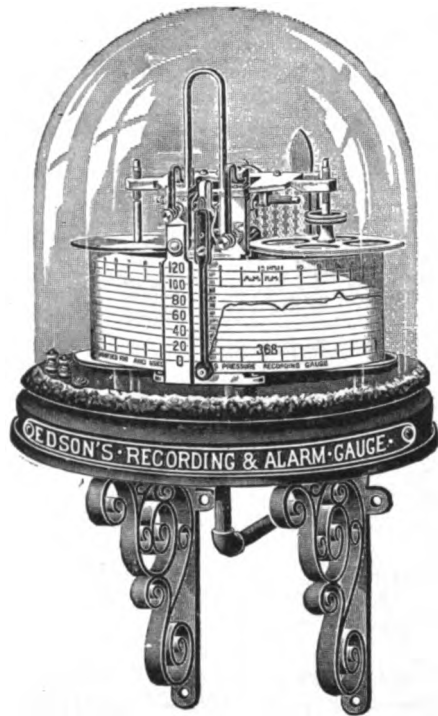


Plate 135.

Complete, with High and Low Pressure Circuit Closers, Bells and Battery, one year's supply of Metallic-surfaced Charts; Fancy Black Iron Brackets, Special Chart Album and Flange Unions.

Price, High Ammonia Pressure	\$110 00
Price, Low Ammonia Pressure	110 00

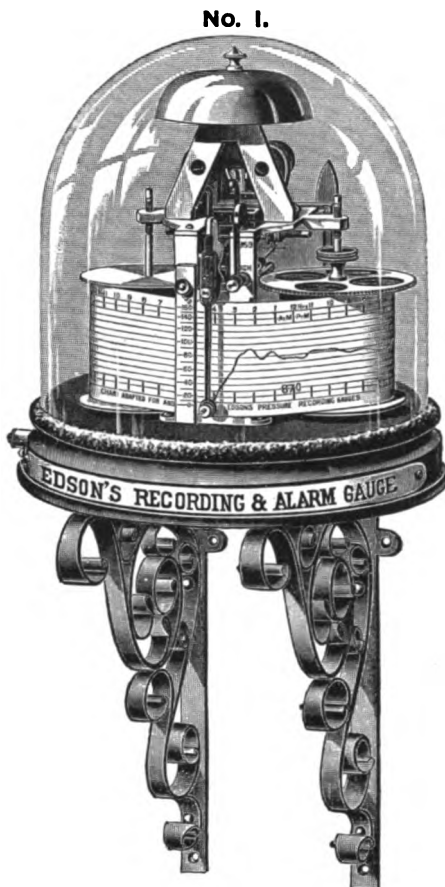


Plate 136.

Style No. 1 has adjustable circuit closer for high pressure, operating an electric bell located on the instrument.

Style No. 2 has adjustable high pressure circuit closer arranged to ring electric bell placed at a distance.

Style No. 3 without circuit closer.

Price, Style No. 1	\$95 00
Price, Style No. 2	90 00
Price, Style No. 3	85 00

Price in all cases includes one year's supply of charts, numbered consecutively for each day in the year, and ruled to the special scale of the instrument; one special album for filing away charts daily as records are made upon them; one lot of shelf and brackets, boxing and shipping.

Adjustable circuit closer for sounding an electric bell when pressure falls below a prescribed limit can be added for \$5.00 extra, if stated in order.

These Recorders have a chart speed one-half inch per hour, which can be made one inch per hour if stated in the order. All orders should carefully state the working pressure as well as the highest pressure allowed to be carried. For pressures above 200 pounds per square inch special figures will be given on receipt of full information.

EDSON'S STEAM PRESSURE- RECORDING AND ALARM GAUGE.

FOR AIR,
GAS, WATER
OR ANY
FLUID
PRESSURE.

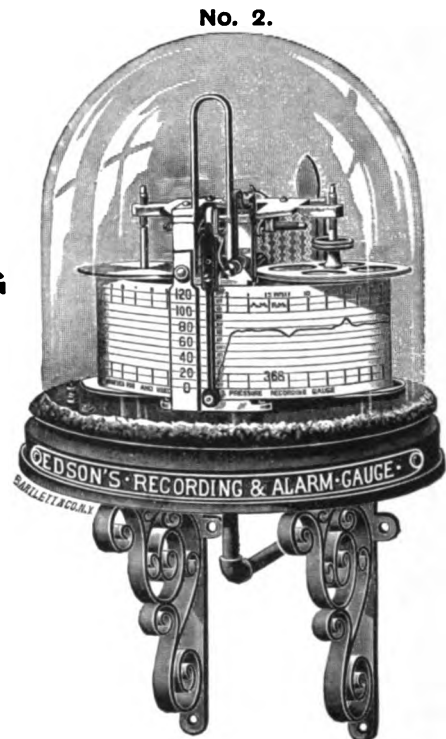


Plate 137.

No. 3.

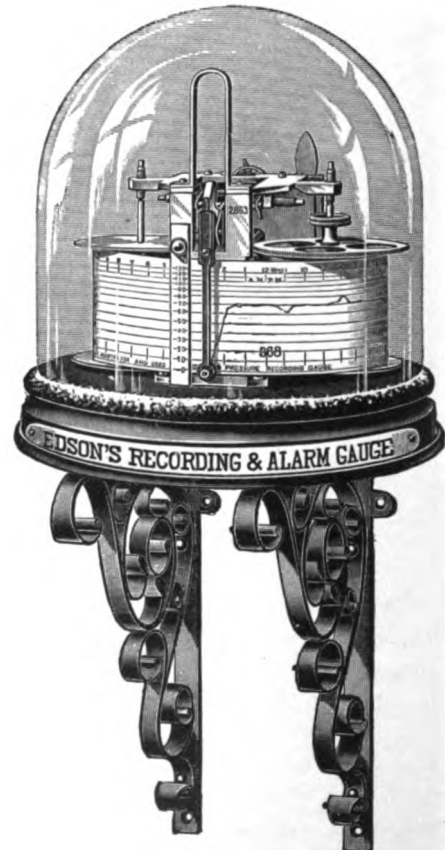
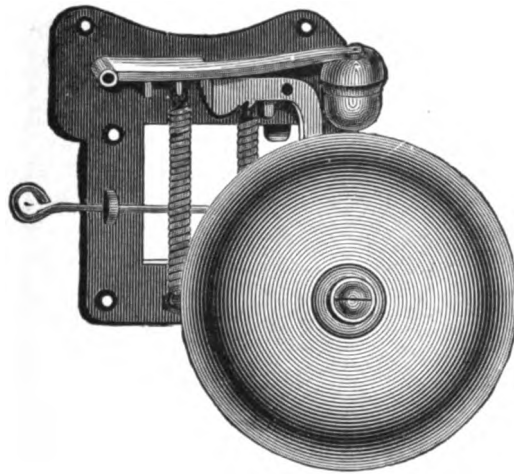


Plate 138.

SIGNAL OR GONG BELL.**Plate 139.**

Size	3	4	5	6	8	10	12	14	16	18	20 in.
Each	\$2 00	2 45	2 95	3 70	5 60	7 90	11 00	15 00	23 00	28 00	33 00

ENGINE BELL**PLAIN.****WITH SPRING.****Plate 140.**

Diameter	3½	4	4½	5	5½	6	6½	7	8	9	10 in.
Price	\$1 75	2 00	2 25	2 50	3 25	3 75	4 50	5 75	7 00	8 50	10 00

REVOLUTION COUNTERS.

SQUARE CASES, BRASS.



Plate 141.

4 figures, size $4\frac{1}{2} \times 1\frac{3}{4}$ inches, each	\$13 50
5 figures, size $5 \times 1\frac{3}{4}$ inches, each	16 00
6 figures, size $5\frac{1}{2} \times 1\frac{3}{4}$ inches, each	20 00
7 figures, size $6 \times 1\frac{3}{4}$ inches, each	24 00
4 figures, size $7 \times 2\frac{1}{2}$ inches, each	20 00
5 figures, size $8 \times 2\frac{1}{2}$ inches, each	24 00
6 figures, size $9 \times 2\frac{1}{2}$ inches, each	28 00
7 figures, size $10 \times 2\frac{1}{2}$ inches, each	32 00

ROUND CASES, BRASS.



Plate 142.

$6\frac{3}{4}$ inch Dial, 6 figures, each	\$ 60 00
$8\frac{1}{2}$ inch Dial, 6 figures, each	70 00
10 inch Dial, 6 figures, each	85 00
12 inch Dial, 6 figures, each	100 00
$8\frac{1}{2}$ inch Dial, 8 figures, each	80 00
10 inch Dial, 8 figures, each	95 00
12 inch Dial, 8 figures, each	110 00

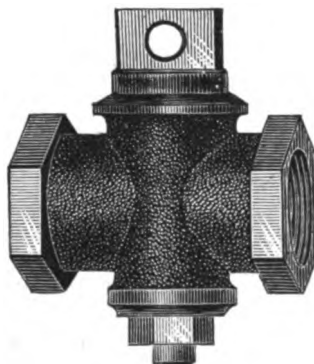
AMERICAN METER CO.'S GAS METER.

L. M. RUMSEY MANUFACTURING COMPANY, GENERAL WESTERN AGENTS.

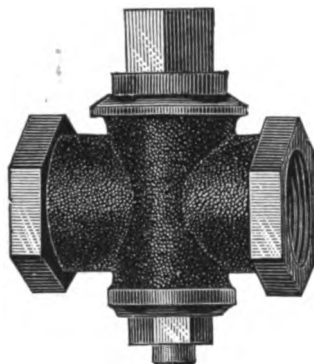
**Plate 143.**

3 Light Meters	\$ 7 50
5 Light Meters	9 50
10 Light Meters	12 00
20 Light Meters	16 50
30 Light Meters	22 50
45 Light Meters	33 00
60 Light Meters	45 00
80 Light Meters	62 00
100 Light Meters	75 00
150 Light Meters	115 00
200 Light Meters	160 00
250 Light Meters	225 00
300 Light Meters	275 00

All Meters are of uniform Standard Quality.

SERVICE COCKS.**STEAM METAL.****FLAT HEAD.****Plate 144.**

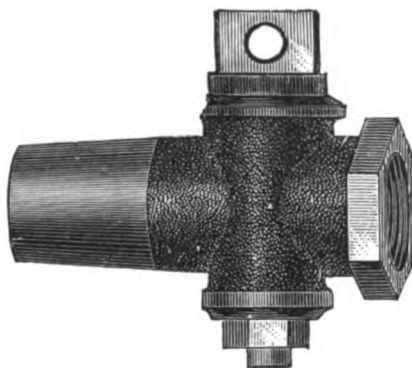
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 75	75	85	95	1 15	1 50	2 25	3 10	5 00	11 00	16 00

STEAM METAL.**SQUARE HEAD.****Plate 145.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 75	75	85	95	1 15	1 50	2 25	3 10	5 00	11 00	16 00

MALLEABLE IRON WRENCH.**FOR GAS AND STEAM COCKS.****Plate 146.**

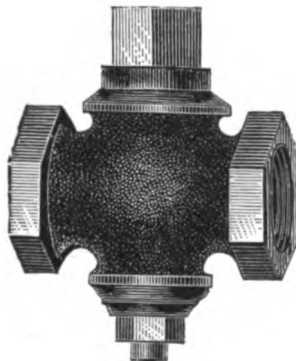
Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 07	08	09	15	25	35	45	80	1 00	1 25

METER COCK.**FLAT HEAD.****Plate 147.**

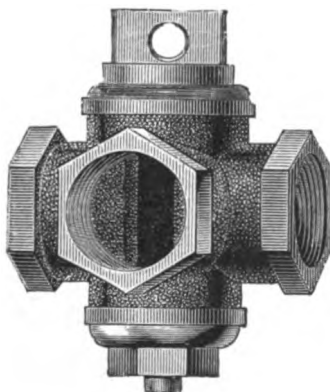
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Each	\$1 30	1 40	1 95	3 00	4 25	6 00

UNION METER COCK.**FLAT HEAD.****Plate 148.**

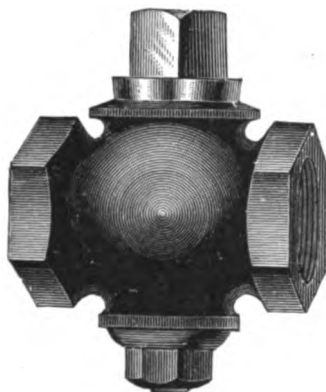
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Each	\$1 40	1 55	2 20	3 40	5 00	7 00

STEAM COCK.**STEAM METAL, FLAT OR SQUARE HEAD.****Plate 149.**

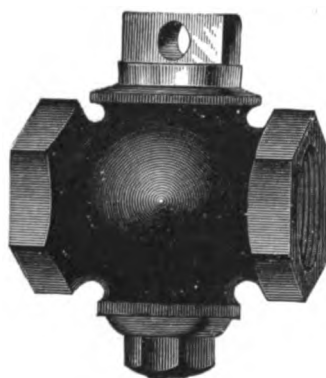
Size . . .	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Each . . .	\$0 85	85	1 00	1 25	1 70	2 35	3 70	4 85	7 30	14 50	22 50	38 50	50 00

THREE-WAY STEAM COCK.**SQUARE OR FLAT HEAD.****Plate 150.**

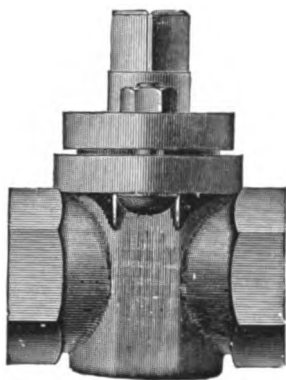
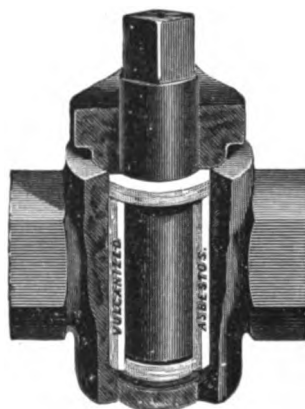
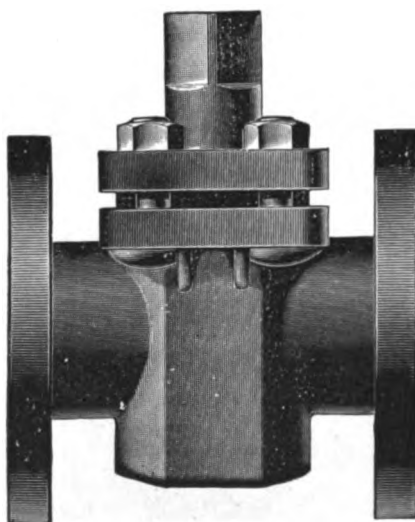
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Steam Metal, each	\$2 50	3 00	3 75	5 75	7 15	11 00	18 75	26 00
Iron, each . . . . .	.....	1 65	1 80	2 05	2 65	3 65	5 35	7 50
Iron, with Brass Plug, each . . . . .	.....	2 20	2 40	3 10	4 50	6 25	9 75	13 75

IRON STEAM COCK.**SQUARE HEAD.****Plate 151.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
All Iron, Flat or Square Head, each	\$0 85	90	1 05	1 30	1 60	1 95	2 70
Size	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 in.	.....
All Iron, Flat or Square Head, each	\$4 40	6 75	12 00	15 50	32 00	45 00	.....

IRON STEAM COCK.**BRASS PLUG.****FLAT HEAD.****Plate 152.**

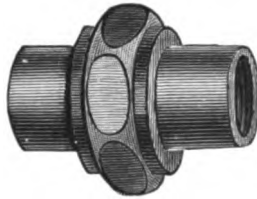
Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Flat or Square Head, each	\$1 25	1 30	1 60	1 90	2 65	3 75	5 25
Size	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 in.	.....
Flat or Square Head, each	8 75	13 00	27 50	36 50	67 00	94 00	.....

ASBESTOS PACKED IRON COCKS.**SCREWED.****Plate 153.****SECTION.****Plate 154.****FLANGED.****Plate 155.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 in.
Iron Screw Ends . .	\$1 30	1 45	1 60	2 10	2 50	3 50	4 75	7 00	12 00	18 00	27 00	30 00	45 00	60 00
Iron Flanged Ends . . . . .	.....	.....	.....	.....	.....	.....	4 75	7 00	12 00	18 00	27 00	30 00	45 00	60 00
Extra Heavy, Screwed or Flanged	1 45	1 60	2 10	2 50	3 50	4 75	7 00	12 00	18 00	27 00	30 00	45 00	.....	.....
For Superheated Steam Screwed or Flanged	1 45	1 60	2 10	2 50	3 50	4 75	7 00	12 00	18 00	27 00	30 00	45 00	60 00	.....

GROUND UNION JOINT.

STEAM METAL.

**Plate 156.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 32	36	50	70	90	1 25	1 70	2 50	3 60	6 00	7 75

BRASS BUSHING.

HEXAGON.

**Plate 157.**

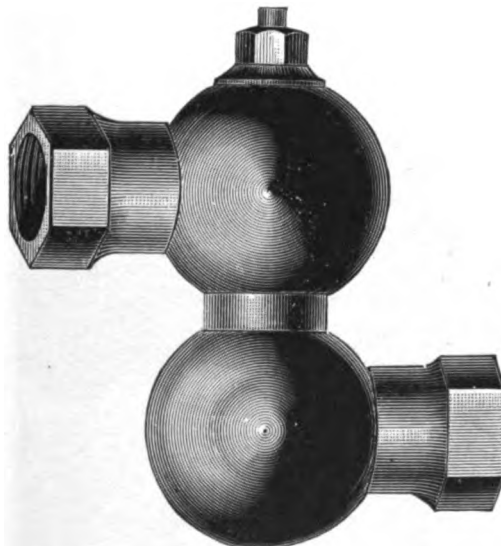
Size .	$\frac{1}{8} \times \frac{1}{4}$	$\frac{1}{4} \times \frac{3}{8}$	$\frac{3}{8} \times \frac{1}{2}$	$\frac{1}{2} \times \frac{3}{4}$	$\frac{3}{4} \times 1$	$1 \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{2}$	$1\frac{1}{2} \times 2$	$2 \times 2\frac{1}{2}$	$2\frac{1}{2} \times 3$ in.
Each	\$0 10	12	14	21	38	50	67	1 00	1 50	2 50

**Plate 158.****FUSIBLE PLUG.**

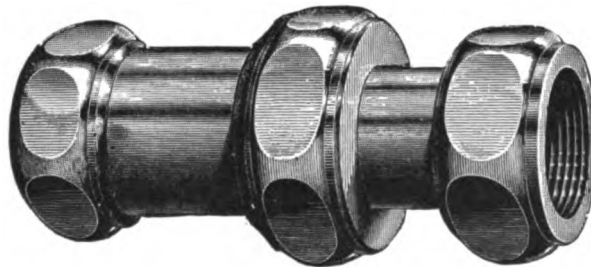
Size	$\frac{1}{8}$	$\frac{3}{4}$	1 in.
Price	\$0 60	75	1 00

SWING JOINT.

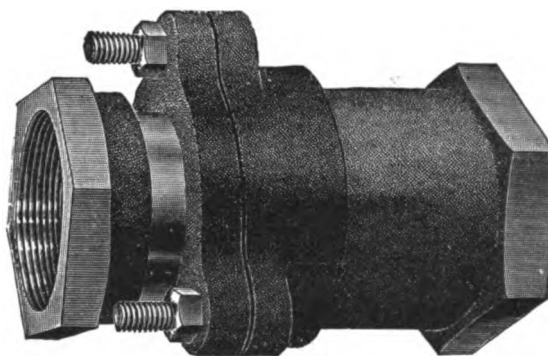
STEAM METAL.

**Plate 159.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Rough, each	\$1 00	1 25	1 75	2 40	3 50	4 60	6 25	9 00
Finished, each	1 25	1 50	2 00	2 75	4 00	5 00	7 00	10 00

EXPANSION JOINT.**STEAM METAL.****Plate 160.****STANDARD TRAVERSE.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Traverse	2	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$ in.
Each	\$1 50	2 20	2 75	4 00	5 00	8 00	17 50	24 00

IRON BODY EXPANSION JOINT.**BRASS SLEEVE.****Plate 161.****STANDARD TRAVERSE.**

Size. . .	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8	9	10	12 in.
Traverse.	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	4	5	6	7	7	7	8 in.
Each . .	\$7 00	8 00	10 00	14 00	18 00	38 00	45 00	70 00	100 00	110 00	160 00	225 00

IRON BODY EXPANSION JOINTS.

FLANGED—BRASS SLEEVE.

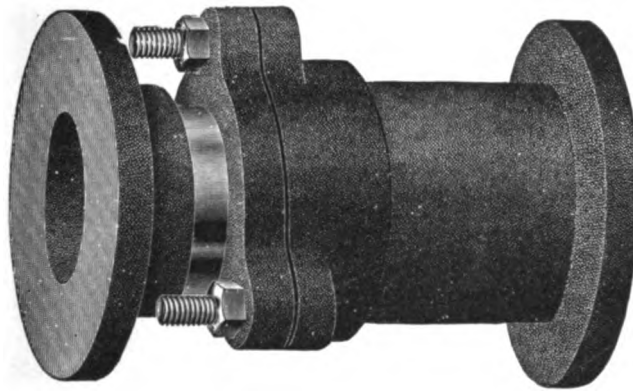


Plate 162.

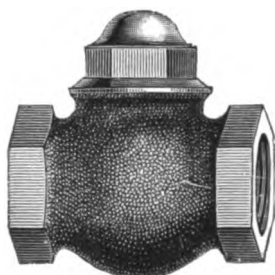
STANDARD TRAVERSE.

Size	2	2½	3	3½	4	5	6 in.
Traverse	2½	2½	2¾	3	3¼	5	5 in.
Diameter of Flanges	6½	7	8	8½	9	10	11 in.
Each	\$15 00	16 00	18 50	25 00	30 00	48 00	55 00
Size	7	8	9	10	12	14	16 in.
Traverse	6	7	7	7	8	10	10 in.
Diameter of Flanges	13	14	15	16	19	21	24 in.
Each	\$80 00	110 00	120 00	175 00	250 00	. .	. .

Prices for 14 and 16 inch quoted on application.

HORIZONTAL CHECK VALVE.

STEAM METAL.

**Plate 163.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Screwed, each .	\$0 65	65	70	90	1 15	1 60	2 25	3 15	4 75	9 00	13 00
Flanged, each .	..	..	..	4 40	4 90	6 50	8 25	10 15	15 50	22 00	33 50

ANGLE CHECK VALVE.

STEAM METAL.

**Plate 164.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Screwed, each .	\$0 72	72	77	1 00	1 26	1 80	2 52	3 50	5 30	10 00	14 40
Flanged, each .	..	..	..	4 50	5 00	6 75	8 50	10 50	16 00	23 00	35 00

VERTICAL CHECK VALVE.

STEAM METAL.

**Plate 165.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Screwed, each	\$0 72	77	1 00	1 26	1 80	2 52	3 50	5 30	10 00	14 40
Flanged, each . . . .	..	..	4 50	5 00	6 75	8 50	10 50	16 00	23 00	35 00

LUNKENHEIMER'S IMPROVED REGRINDING CHECK VALVES.

HORIZONTAL CHECK VALVE.



Plate 166.

VERTICAL CHECK VALVE.



Plate 167.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in
Check Valves, Horizontal and Vertical, each	\$0 50	50	60	85	1 15	1 55	2 30	3 25	5 20	10 00	14 00

BALL CHECK VALVE.

BALL CHECK VALVE.

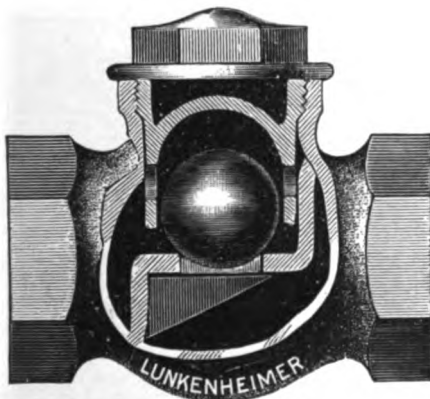


Plate 168.

BRASS BALLS.

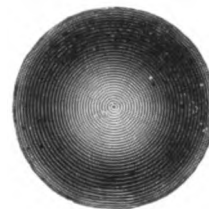


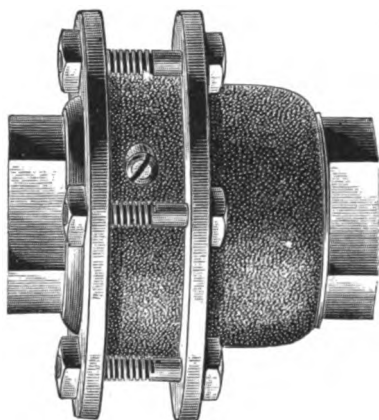
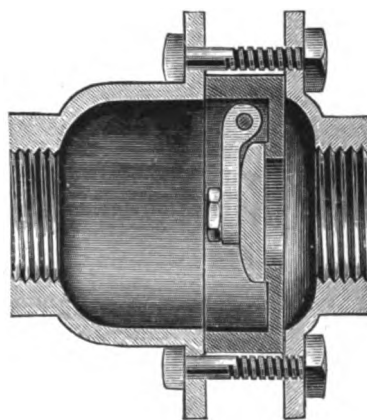
Plate 169.

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in
Ball Check Valves, each	\$1 10	1 60	2 30	3 10	4 00	6 20	9 40

BRASS BALLS.

Sizes above $1\frac{1}{2}$ inches are cast hollow.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	$3\frac{3}{4}$	4	5	6 in.
Each	\$0 60	65	75	1 00	1 50	2 75	4 50	5 25	6 00	7 00	8 00	9 00	13 00	18 50

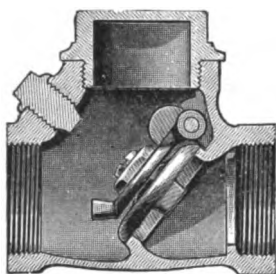
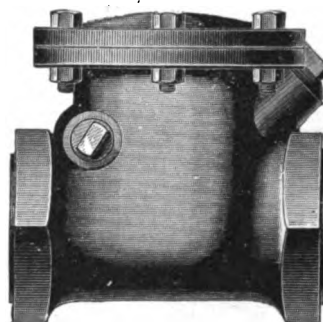
BELKNAP STRAIGHTWAY CHECK VALVES.**Plate 170.****Plate 171.**

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8 in.
Screwed Ends, \$	1 50	1 90	3 00	4 00	5 75	10 00	12 50	16 00	18 00	25 50	29 00	35 00	51 00	64 00
Flanged Ends,						11 00	14 00	18 00	20 00	28 00	32 00	38 00	54 00	68 00

DUPLICATE VALVES AND SEATS.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10 in.
Price . . . \$	1 00	1 25	1 90	2 40	3 50	4 20	6 00	8 00	10 00	12 00	15 00	17 00	23 00	30 00	40 00
Add for L'rD's	20	20	20	20	30	40	50	60	80	1 00	1 20	1 50	1 80	2 10	2 50

On small sizes to 2 inches, the Shells are Malleable Iron, and Gray Iron on larger sizes. All working parts are of the best Steam Metal.

P. & C. SWINGING CHECK VALVES.**STEAM METAL.****Plate 172.****IRON BODY.****Plate 173.****STEAM METAL.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Brass Check Valves	\$1 25	1 25	1 30	1 75	2 25	3 25	4 25	6 25	11 50	16 00
Brass Check Valves, Angle			1 30	1 75	2 25	3 25	4 25	6 25		

IRON BODY.

Size	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8	10	12 in.
Iron Body Check Valves, Flanged, Screwed and Bell Ends . . . \$	8 25	10 00	12 00	16 00	18 00	25 00	32 00	41 00	50 00	65 00	95 00

Flanged, Screwed and Bell Ends. Sizes, 2 to 16 inches. Brass, Leather or Asbestos Discs, as required.

IRON BODY CHECK VALVES.

BRASS MOUNTED, HORIZONTAL, VERTICAL OR ANGLE.

VERTICAL.

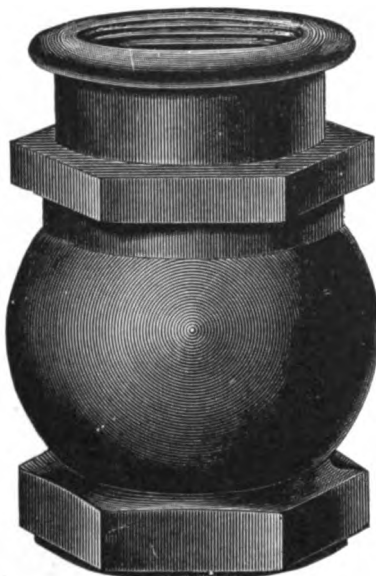


Plate 174.

HORIZONTAL.

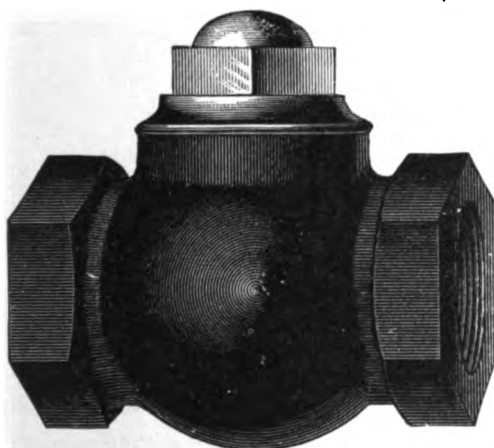


Plate 175.

ANGLE.

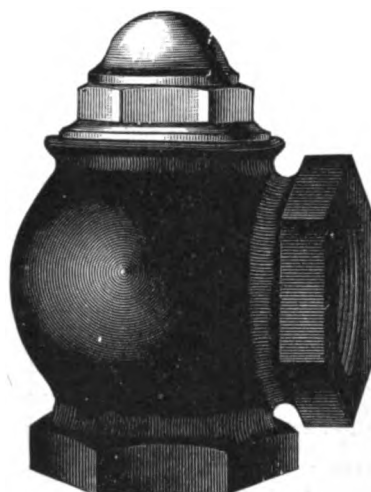


Plate 176.

Size	2	2½	3	3½	4	4½	5	6	7	8 in.
Vertical Screw, each . .	\$7 00	9 50	12 50	17 00	21 00	30 00	33 00	40 00	62 00	73 00
Vertical Flanged, each .	8 75	11 50	15 00	20 00	25 00	33 50	37 00	45 00	67 00	78 00
Size	1	1¼	1½	2	2½	3	3½ in.			
Horizontal and Angle, Screw each . . .	\$1 50	2 20	2 65	3 60	6 50	8 90	12 25			
Horizontal and Angle, Flanged, each . .	2 50	3 25	4 00	5 25	8 25	11 50	15 50			
Size	4	4½	5	6	7	8				
Horizontal and Angle, Screw, each . . .	\$14 25	19 00	22 00	30 00	45 00	57 00				
Horizontal and Angle, Flanged, each . . .	18 00	22 50	26 00	35 00	50 00	62 00				

RICHARDSON'S WATER RELIEF VALVE.

FOR WATER WORKS, FIRE PUMPS AND FACTORIES.

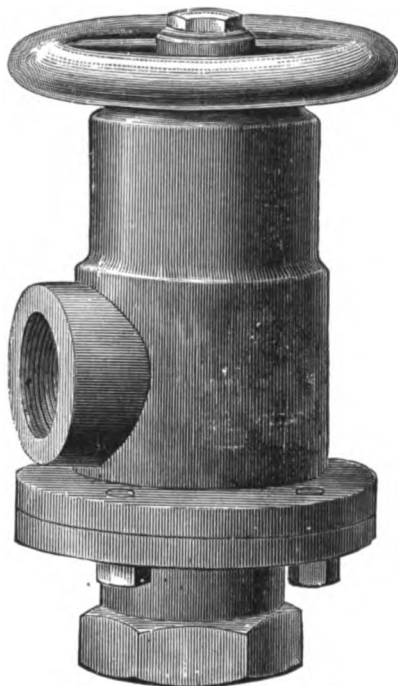


Plate 177.

This valve, as its title indicates, is designed to protect water chambers of Steam Fire Engines, Steam Pumps, Rotary Pumps, Fire Hose, etc., from excessive pressure, due to the closing of gates or stop valves and the turning off of water at the hose nozzle while the pump is in motion. It gives the hoseman control of the stream at the end of the line, as the sudden shutting off of the water does not subject the hose or pump to a pressure greater than that at which the valve is set at, thus damage by the bursting of the pipe or the hose is prevented. A night watchman without assistance can start a pump with safety. The outlet can be piped to the suction (making a "run-around"), as the valve case is water tight. By its use the needless flooding of buildings can be avoided. It is recommended and approved by all Fire Insurance Companies.

Valves for trial will be furnished.

Diameter	1½	2	2½	3	3½	4	5	6 in.
Price, each	\$30 00	40 00	55 00	75 00	85 00	100 00	125 00	150 00

In ordering, state Highest Working Pressure.

THE ECLIPSE PRESSURE REGULATOR OR REDUCING VALVE.

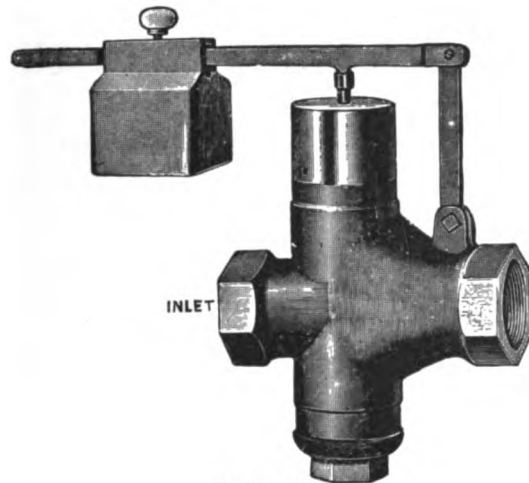


Plate 178.

These valves are adapted for use in distilleries, sugar refineries, paper mills, heating apparatus, or manufacturing requiring a constant, unvarying pressure below ten pounds, notwithstanding the variation that may take place in the boiler. It is the most simple, reliable and sensitive valve made. No packing, stuffing boxes or rubber. By adjusting the weight, any desired pressure can be maintained indefinitely. They are lower in price than any other pressure regulator on the market. These valves are intended to maintain a pressure not exceeding 10 pounds on the square inch on the low pressure side.

Size	1	1¼	1½	2	2½	3	3½	4	4½	5	6 in.
Price, each . .	\$18 00	19 00	20 00	25 00	30 00	35 00	45 00	50 00	60 00	65 00	80 00

Parties ordering valves will please answer the following questions: Size of valve wanted? Boiler pressure that is carried? Want to reduce to what pressure?

THE ECLIPSE PNEUMATIC BACK-PRESSURE VALVE. FOR EXHAUST STEAM HEATING, ETC.

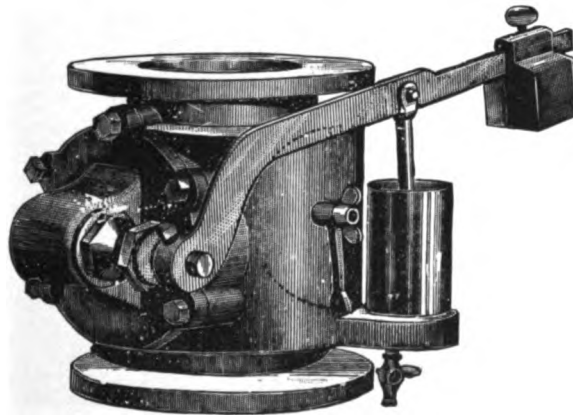


Plate 179.

Our Pneumatic Back-Pressure Valve is perfectly noiseless. In general design it is similar to the ordinary valve, but it is provided with an air-cushion or dash-pot. Its action is as follows: In the base of the dash-pot there is an inlet valve or poppet (not shown in the illustration), which, on the slightest application of pressure under the valve disc, admits air to the dash-pot and allows the disc to rise off the seat as rapidly and to as great an extent as the amount of steam to be passed through the valve requires. At the end of each stroke of the engine, when the disc of the valve is temporarily relieved of pressure, the inlet valve or poppet in the base of the dash-pot closes on its seat, thus confining the air in the dash-pot. In the illustration a pet cock is shown under the dash-pot, which is for the purpose of regulating the discharge of air therefrom, and when the valve disc is relieved of pressure at the end of each stroke of the engine, it can only close to its seat with a speed proportionate to the discharge of air through the air cock under the dash-pot, thus preventing the loud and disagreeable hammering and the rapid destruction of the seat and disc by abrasion.

Size	3	4	5	6	7	8	10	12 in.
Price, each	\$17 50	25 00	36 00	49 00	80 00	91 00	145 00	220 00

BACK PRESSURE VALVE.

IRON BODY, BRASS MOUNTED.

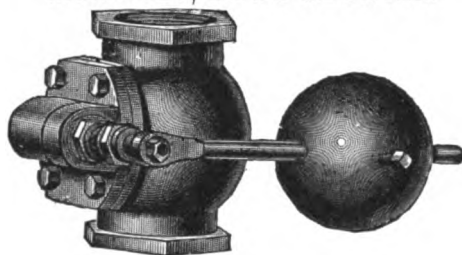


Plate 180.

Size	1½	2	2½	3	3½	4	4½	5	6	8	10	12 in.
Screwed, each .	\$ 9 00	11 00	13 00	15 00	19 00	22 50	28 50	33 50	43 00	85 00	120 00	180 00
Flanged, each .	10 50	12 75	15 00	17 50	22 00	26 00	32 00	37 00	47 00	90 00	130 00	200 00

BUTTERFLY VALVE.

SCREWED.

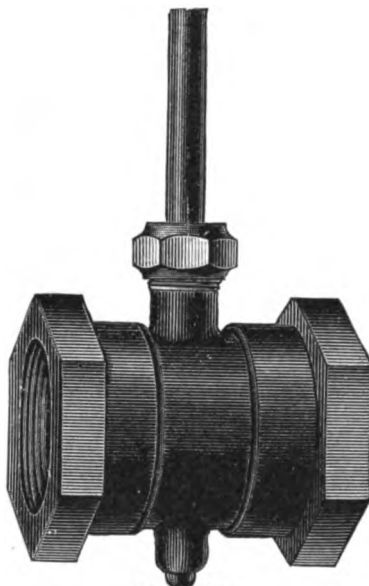


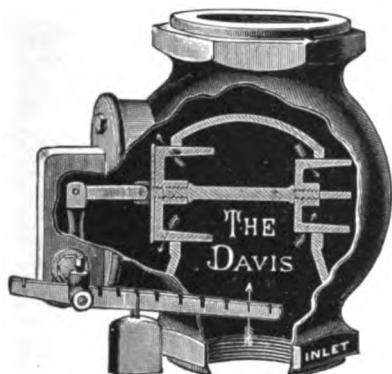
Plate 181.

Size	¾	1	1½	1½	2	2½	3	4 in.
Steam Metal, each	\$3 10	4 40	5 65	6 75	10 00	13 75	21 00	.....
Iron Body, each . . . . .	.....	.....	6 35	7 00	8 00	9 50	12 00	18 50

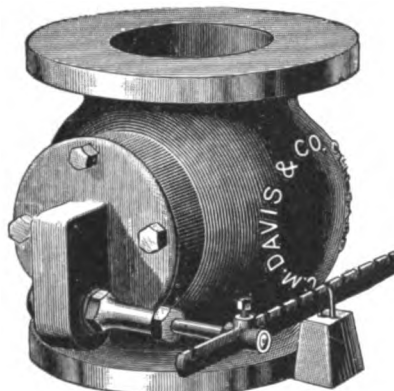
VACUUM VALVE.

Plate 182.

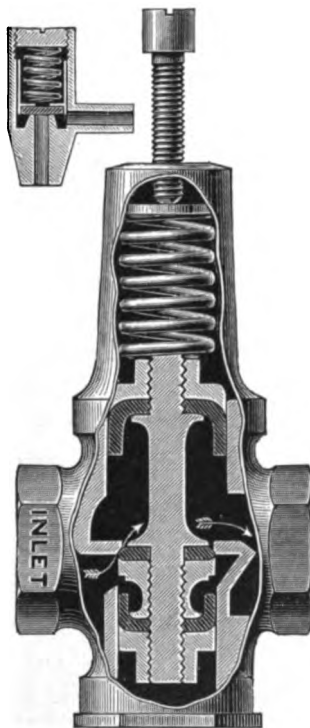
Size	¼	¾	½	¾	1 in.
Each	\$1 00	1 25	1 50	2 00	2 50

DAVIS' NOISELESS BACK-PRESSURE VALVES.**SCREWED.****Plate 183.**

2 inch, each	\$14 00
2½ inch, each	16 00
3 inch, each	18 00
3½ inch, each	22 00
4 inch, each	25 00
4½ inch, each	30 00
5 inch, each	40 00
6 inch, each	60 00
7 inch, each	80 00

FLANGED.**Plate 184.**

8 inch, 14 inch Flange, each	\$ 100 00
10 inch, 17 inch Flange, each	145 00
12 inch, 19 inch Flange, each	220 00
14 inch, 21 inch Flange, each	345 00
16 inch, 24 inch Flange, each	465 00
18 inch, 26 inch Flange, each	600 00
20 inch, 29 inch Flange, each	750 00
22 inch, 31 inch Flange, each	900 00
24 inch, 34 inch Flange, each	1,050 00

MUELLER WATER PRESSURE REGULATOR.**Plate 185.**

This Regulator can be set at any pressure desired in the building, and it will maintain the same, no matter how great the pressure may be in the mains.

Size	½	¾	1	1½	2	2½	3	4 in.
For Iron Pipe, each	\$10 00	10 00	13 00	17 50	24 00	40 00	55 00	70 00
For Lead Pipe, extra, net	25	25	25	.....	.....	.....	.....	.....
Relief Valve, extra, net,	25	.....	.....	.....	.....	.....	.....	.....

KIELEY'S HIGH PRESSURE REDUCING VALVE.

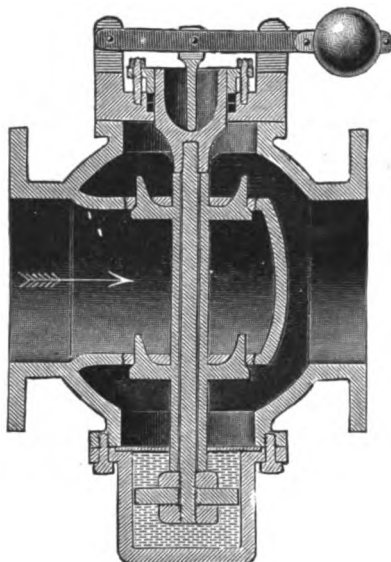


Plate 186.

Above we illustrate a sectional view of the Kieley High Pressure Reducing Valve, which is especially designed and constructed to carry as high as 200 pounds on the high pressure side and to reduce the pressure on the low side anywhere from 15 to 180 pounds, without the slightest variation.

WHY IT IS THE BEST AND THE ONLY PERFECT VALVE BUILT FOR HIGH PRESSURE SERVICE:

Because it has no springs to get out of order.

Because it has no rubber or metallic diaphragms to be constantly breaking.

Because it has no waste-pipe to cause extra steam and water to be wasted.

Because of it requiring no extra connecting pipes it has no leak of steam or water to cause dripping or slopping, which is an annoyance unavoids by any other valve.

Because there is nothing to get out of order, except the regular packing box on any ordinary Globe or Gate Valve. The cost of repacking this stuffing box and the time required to do same is so trivial as to be considered nominal.

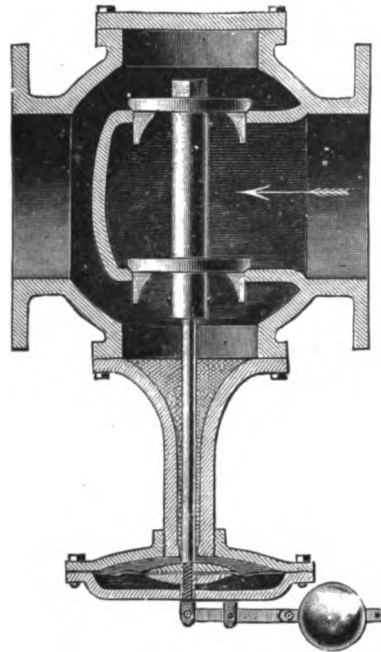
This valve should be used wherever it is intended to carry a reduced pressure of more than 25 pounds, and from that up to 150 pounds.

Size of Valve	1	1¼	1½	2	2½	3	4 in.
Diameter of Flanges . . . . .	.....	.....	.....	.....	7	8	10 in.
Distance, face to face of Flanges . . . . .	.....	.....	.....	.....	7	8	10½ in.
Prices	\$ 22 00	28 00	35 00	44 00	57 00	72 00	100 00
Size of Valve	5	6	7	8	9	10	12 in.
Diameter of Flanges	11	12	13	14	.....	15	18 in.
Distance, face to face of Flanges	11¼	12¼	13¼	14¼	.....	16¼	18¼ in.
Price, each	\$135 00	180 00	225 00	275 00	350 00	350 00	470 00

IMPROVED EUREKA PRESSURE REGULATING VALVES.

FOR REDUCING PRESSURE ON ALL KINDS OF STEAM HEATING APPARATUS.

(KIELEY'S PATENT.)

**Plate 187.****WHY THIS REGULATOR IS SUPERIOR TO ALL OTHERS:**

1. Because the Diaphragm is made of the most flexible and durable material in the market.
2. Because the Discs of the Valve are so made as to produce a perfectly balanced Valve, which has not been accomplished heretofore.
3. Because it has no waste pipe to cause extra waste of steam and water.
4. Because it has no springs to get out of order.
5. Because it gives the full area of the pipe.
6. Its great simplicity, there being no complicated parts to get out of order
7. Because it makes less noise than any other Valve made.
8. On account of its flexible Diaphragm, accurately balanced discs, nicety of adjustment and great area of Diaphragm, it is the best and most sensitive Pressure Regulating Valve made.

DIRECTIONS FOR CONNECTING.

Connect end of valve marked "inlet" to the high pressure. Have the diaphragm underneath, so as to allow the water of condensation to remain on it, and also to prevent steam from coming in contact with it. Connect the short or slotted end of lever to the two lugs extending down through center of diaphragm, so that the two lugs extending down from the casing become the fulcrum. To adjust the weight so that the valve will give the desired pressure, move it in or out as the case may demand until the desired pressure is obtained, after which fasten the weight to the lever by setting up on the thumb-screw.

Size of Valve	1	1¼	1½	2	2½	3	4 in.
Diameter of Flanges . . . .	.....	.....	.....	.....	7	8	10 in.
Distance, face to face of Flgs.	.....	.....	.....	.....	7	8	10½ in.
Prices	\$ 22 00	28 00	35 00	44 00	57 00	72 00	100 00
Size of Valve	5	6	7	8	9	10	12 in.
Diameter of Flanges	11	12	13	14	.....	16	18 in.
Distance, face to face of Flgs.	11¼	12¼	13¼	14¼	.....	16¼	18¼ in.
Prices	\$135 00	180 00	225 00	275 00	350 00	350 00	470 00

WATSON'S STEAM PRESSURE REGULATOR.

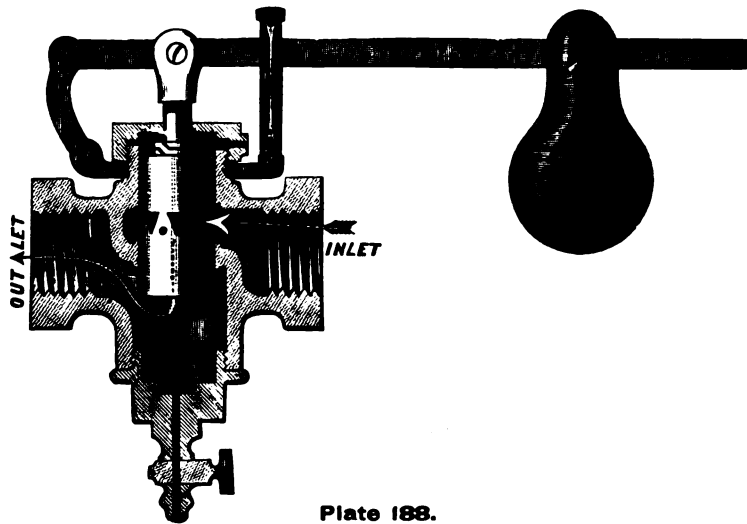
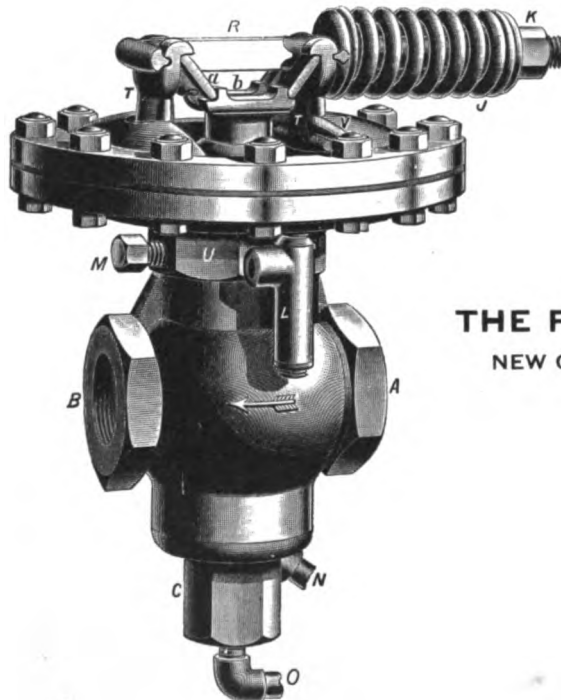


Plate 188.

Size, Brass Regulators, Screwed Ends	1	1 1/4	1 1/2	2	2 1/2	3 in.
Each	\$17 00	22 00	28 00	38 00	55 00	70 00
Size, Iron Bodies, Brass Lined, Screwed Ends					2	2 1/2 in.
Each					\$38 00	55 00

IRON BODY AND BRASS LINED, MADE WITH FLANGES ALSO TAPPED FOR SCREWING,
AND CAN BE USED EITHER WAY.

Size		3	4	6 in.
Each		\$70 00	90 00	150 00



THE FOSTER.
NEW CLASS W.

Plate 189.

As a high pressure pump governor, controlling hydraulic pressures above 250 pounds.
In ordering, state the approximate discharge water pressure.

Size	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5 in.
Screwed Ends	\$21 60	26 40	33 60	42 00	52 80	68 40	86 40	103 20	120 00	162 00
Flanged Ends				44 40	55 20	72 00	90 00	108 00	126 00	168 00

THE FOSTER NEW CLASS W AUTOMATIC PRESSURE REGULATOR AND REDUCING VALVE

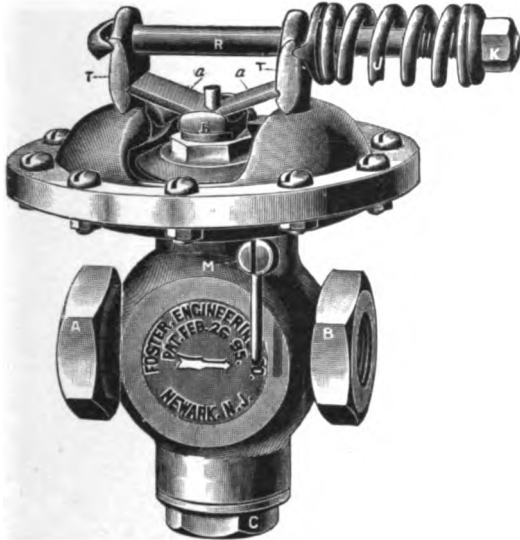


Plate 190.

EXTERIOR VIEW OF VALVE, $\frac{3}{4}$ IN. TO 2 IN.

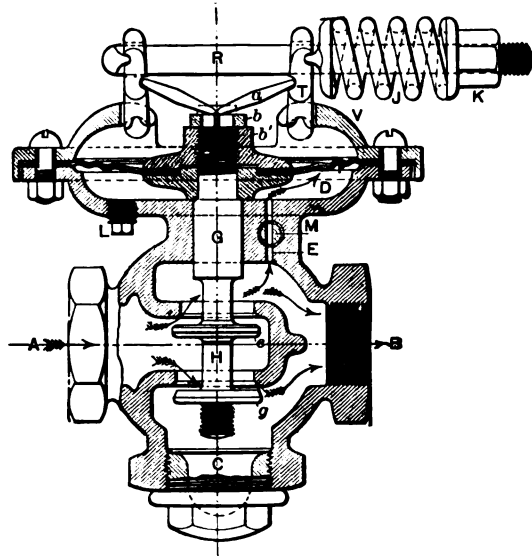


Plate 191.

*SECTIONAL VIEW OF PLATE 190.

Description.—(A) Inlet. (B) Outlet, when used as a straightway valve. (C) Outlet, when used as an angle valve. (D) Diaphragm Chamber. (E) Steam-port, connecting valve chamber with diaphragm chamber. (F) Diaphragm. (G) Valve-stem. (H) Double-seated Valve-Clapper. (K) Nut, for regulating discharge pressure. (Turn to the right to increase, and to the left to diminish, pressure.) (M) Port-screw for closing or partly closing off steam from diaphragm chamber.

N. B.—A slot in head of Port-screw indicates direction of port. With the Regulator in a vertical position, as shown in illustration, the Port-screw is open when the slot is vertical. Port-screws having no slot in head (used on large valves) are closed by turning screw to the right as far as it will go.

Size in inches.	Screwed Ends.	Flanged Ends.	Diameter of Flanges.*	Distance bet. Faces.*	Approx. Weights in Iron.	
					Screwed.	Flanged.
$\frac{3}{4}$	\$ 20 00	.....	.....	.....	10 lbs.	.....
1	22 00	.....	.....	.....	11 "	.....
$1\frac{1}{4}$	28 00	.....	.....	.....	20 "	.....
$1\frac{1}{2}$	35 00	\$ 37 00	$5\frac{3}{8}$ inches	$5\frac{3}{8}$ inches	22 "	.....
2	44 00	46 00	6 "	7 "	42 "	46 lbs.
$2\frac{1}{2}$	57 00	60 00	7 "	$7\frac{3}{8}$ "	52 "	60 "
3	72 00	75 00	$7\frac{1}{2}$ "	$9\frac{1}{2}$ "	57 "	75 "
$3\frac{1}{2}$	90 00	95 00	$8\frac{1}{2}$ "	11 "	75 "	90 "
4	100 00	105 00	9 "	12 "	108 "	154 "
5	135 00	140 00	10 "	$13\frac{1}{4}$ "	158 "	196 "
6	180 00	185 00	11 "	$16\frac{1}{8}$ "	223 "	263 "
7	.....	220 00	$12\frac{1}{2}$ "	$18\frac{1}{4}$ "	.....	412 "
8	.....	260 00	$13\frac{1}{2}$ "	$18\frac{1}{4}$ "	.....	413 "
10	.....	350 00	16 "	$19\frac{1}{4}$ "	.....	517 "
12	.....	450 00	19 "	$26\frac{1}{4}$ "	.....	800 "
14	.....	575 00	21 "	31 "	.....	1400 "
16	.....	700 00	$23\frac{1}{2}$ "	34 "	.....	1600 "
18	.....	875 00	25 "	37 "	.....	2000 "

*This construction will operate equally well in any position, whether vertical, horizontal or inverted, except for very low pressures (1 to 5 lbs.), when it will give better service if placed in horizontal position with diaphragm facing down.

THE FOSTER STANDARD PRESSURE REGULATOR AND REDUCING VALVE.

CLASS E.—SOREWED ENDS.

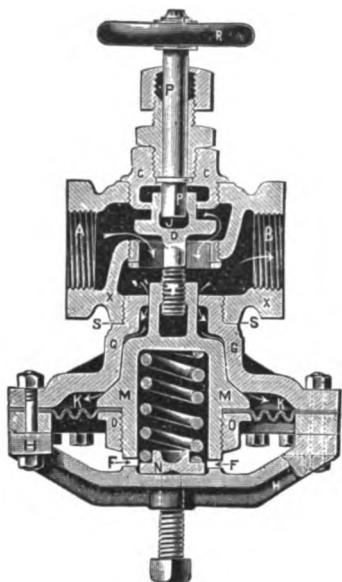


Plate 192.

FOR REGULATING STEAM,
WATER, GAS OR AIR
PRESSURES

In all general industries:
Breweries, Textile Works,
Paper Mills, etc.

For Steam Heating, Electric
Light and Power Plants, Marine
Service, Railroads.

Standard in U. S. Navy.

In ordering, state initial and
delivery pressure desired; also
service required, and whether
screwed or flanged ends.

CLASS F.—SOREWED ENDS.

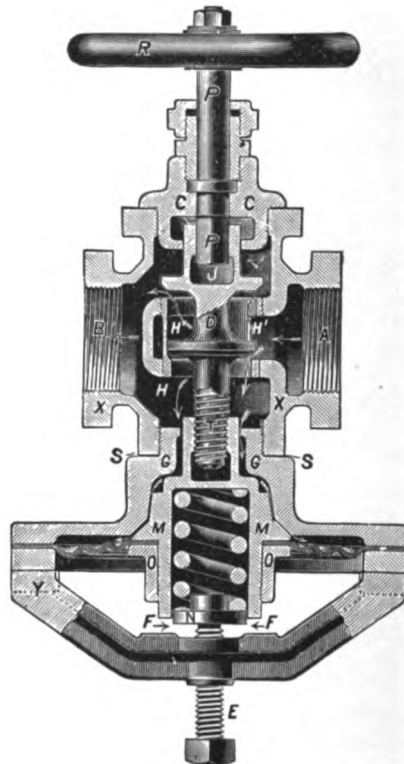


Plate 193.

CLASS H.—FLANGED.

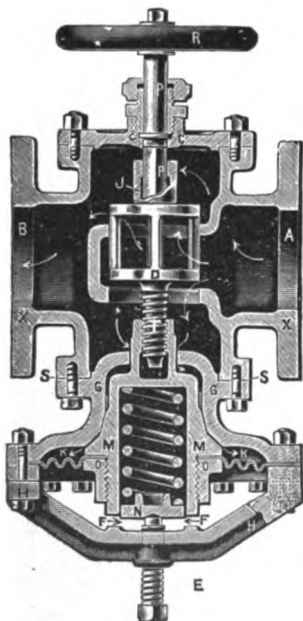


Plate 194.

CLASS E.

Size	1	1¼	1½	2 in.
Price	\$22 00	28 00	35 00	44 00

CLASS F.

Size	2	2½	3	4	5	6 in.
Price	\$47 00	60 00	75 00	105 00	140 00	180 00

CLASS H.

Size	2	2½	3	4	5 in.
Price	\$50 00	63 00	78 00	110 00	145 00
Size	6	8	10	12 in.	
Price	\$190 00	295 00	420 00	575 00	

An extra price of 25c. per lb. is charged for all steam metal or Government composition.

THE FOSTER NEW CLASS W PRESSURE REGULATOR, REDUCING VALVE AND PUMP GOVERNOR.

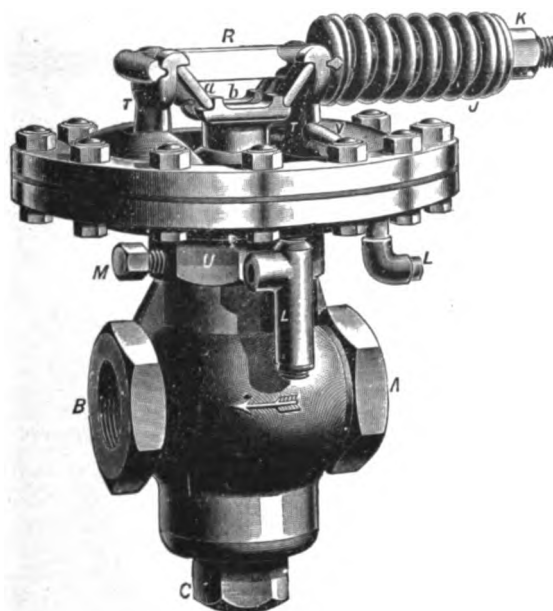


Plate 195.

The Standard Valve for all plants where steam, water, gas or air pressures are to be reduced and regulated.

Over 21,000 in service. The Standard Valve of many Railroads. The Standard Valve of U. S. Navy. The Standard Valve in Industrial Establishments. The Standard Valve in Electrical Plants, Etc.

Size.	Screwed Ends.	Flanged Ends.	Union Ends.	Diameter of Flanges.*	Distance bet. Faces.*
$\frac{3}{4}$ in.	\$18 00	.....	19 00	.....	.....
1 in.	22 00	.....	23 00	.....	.....
$1\frac{1}{4}$ in.	28 00	.....	29 00	.....	.....
$1\frac{1}{2}$ in.	35 00	37 00	38 00	$5\frac{3}{8}$ in.	$5\frac{3}{8}$ in.
2 in.	44 00	48 00	45 00	$6\frac{1}{2}$ in.	$7\frac{1}{2}$ in.
$2\frac{1}{2}$ in.	57 00	60 00	.....	7 in.	$7\frac{3}{8}$ in.
3 in.	72 00	75 00	.....	8 in.	$9\frac{1}{4}$ in.
$3\frac{1}{2}$ in.	86 00	90 00	.....	9 in.	11 in.
4 in.	100 00	105 00	.....	10 in.	12 in.
5 in.	135 00	140 00	.....	11 in.	$14\frac{1}{2}$ in.
6 in.	180 00	185 00	.....	12 in.	16 in.
7 in.	210 00	220 00	.....	13 in.	$18\frac{1}{4}$ in.
8 in.	250 00	260 00	.....	14 in.	$18\frac{1}{4}$ in.
10 in. . . . .	.....	350 00	.....	16 in.	19 in.
12 in. . . . .	.....	450 00	.....	19 in.	$26\frac{1}{4}$ in.
14 in. . . . .	.....	575 00	.....	$21\frac{1}{2}$ in.	31 in.
16 in. . . . .	.....	700 00	.....	.....	.....
18 in. . . . .	.....	875 00	.....	$25\frac{3}{8}$ in.	37 in.

*These are the standard dimensions. Flanges with different dimensions or distances between faces are made only to order, for which a small additional price is charged. Drilling Flanges extra.

Prices quoted are for Iron Body Valves, Brass Trimmed. An extra price is charged for all Steam Metal or Government Composition.

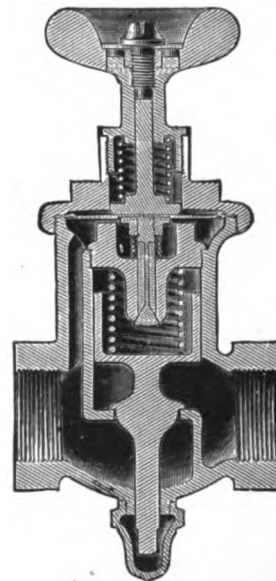
In ordering, state the service, and approximate initial and delivery pressures desired.

AUTOMATIC DAMPER REGULATOR.**Plate 196.**

Damper Regulator, Complete, 6 inch, each	\$10 00
Damper Regulator, without Lever, Hook or Weights, each	7 00
Extra Diaphragms, net, each	75
Extra Weights and Hooks, net, each	1 00
Extra Levers, net, each	25
Extra Hooks, net, each	25

CURTIS' PRESSURE REGULATORS.

FOR STEAM AND WATER.

**Plate 197.****Plate 198.**

Size	1	1¼	1½	2	2½	3	4	5	6 in.
Each	\$22 00	28 00	35 00	44 00	57 00	72 00	100 00	135 00	180 00

LUNKENHEIMER'S LEVER THROTTLE VALVES.

BRASS BODY, SCREWED.



Plate 199.

IRON BODY.

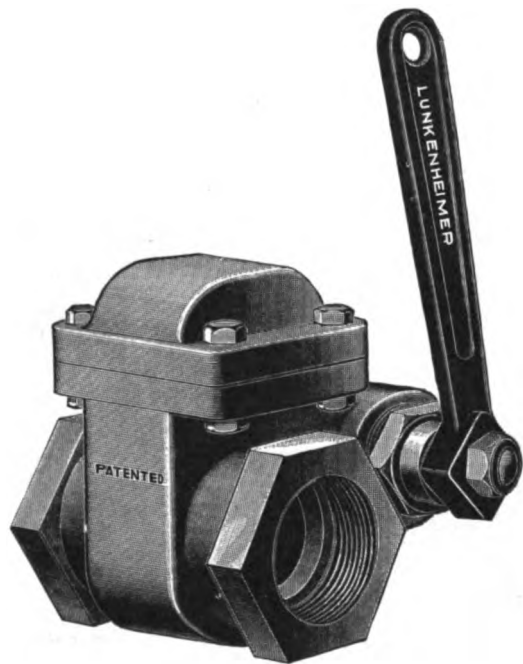


Plate 200.

These Valves are especially adapted as a throttle for traction hoisting and yacht engines, steam shovels, saw mills, pile drivers, steam hammers, and wherever a compact, simple, durable and reliable quick opening valve is wanted.

Brass and Iron Body. Screwed ends only, not made with flanged ends.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 in.
Brass Body, each .	\$3 00	4 00	5 00	7 00	10 00	19 00	.....	.....	.....	.....	.....
Iron Body, each . .	.....	.....	.....	.....	.....	16 00	20 00	25 00	30 00	35 00	40 00

LUNKENHEIMER'S IMPROVED HANDY GATE VALVE.

FOR LOW PRESSURE NOT EXCEEDING 75 POUNDS.

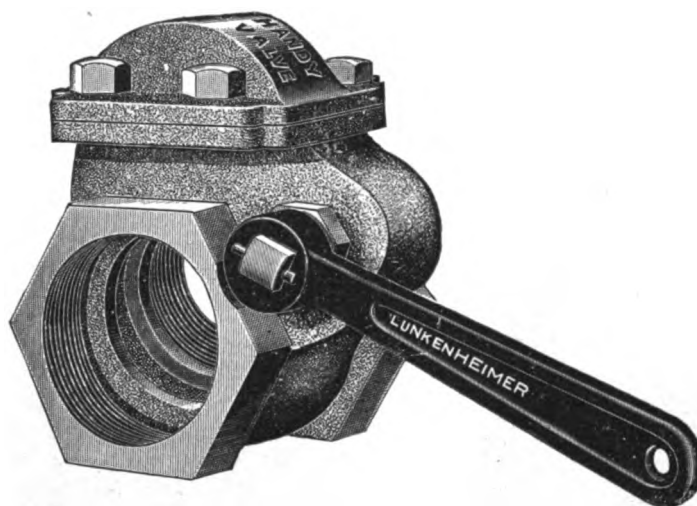


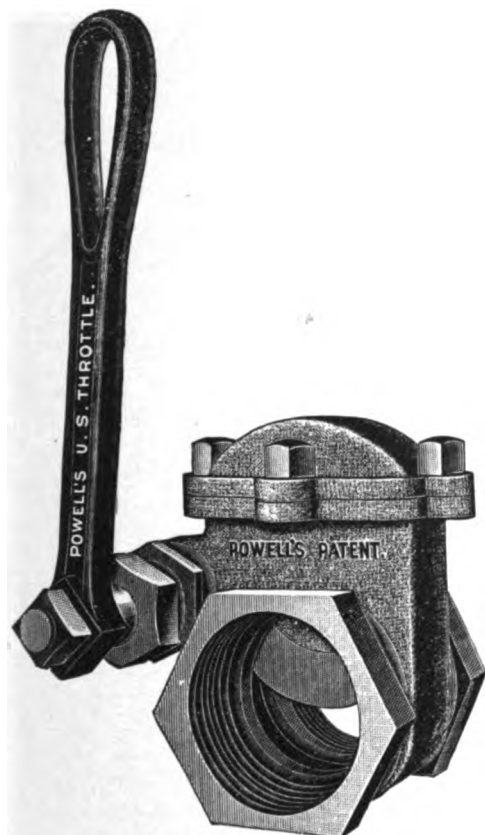
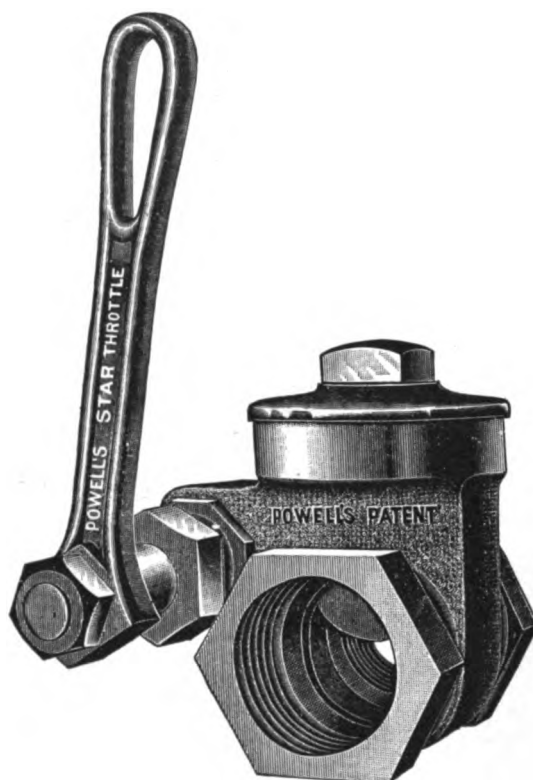
Plate 201.

For use in Refineries, Pulp and Chemical Fiber Mills, Breweries, Tanneries, Oil and White Lead Works; also for Steam and Hot Water Heating, Fuel Gas and Fire Extinguishing Apparatus, Laundry Machinery, Railroad Water Stations, Irrigating Purposes, etc.

Screwed Ends only.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Brass Body, each	\$1 60	1 80	2 50	3 50	5 00	7 50	13 50	19 00
Iron Body, Brass Trimmings, each	.....	.....	.....	.....	.....	9 00	12 00	15 00
All Iron, each	.....	.....	.....	4 50	6 00	9 00	12 00	15 00
Size	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10 in.
Brass Body, each	\$36 00	60 00	75 00	96 00	120 00	.....	.....	.....
Iron Body, Brass Trimmings, each	18 00	21 00	25 00	30 00	35 00	48 00	65 00	100 00
All Iron, each	18 00	21 00	25 00	30 00	35 00	48 00	65 00	100 00

The Handy is also made in Acid Metal (special discount from brass list). Also furnished threaded for Casing Pipe, or with English Standard Pipe Threads.

POWELL'S THROTTLE VALVES.**POWELL'S U. S. THROTTLE VALVE.****Plate 202.****POWELL'S STAR THROTTLE VALVE.****Plate 203.****LIST ON U. S. ALL BRASS THROTTLE VALVE.**

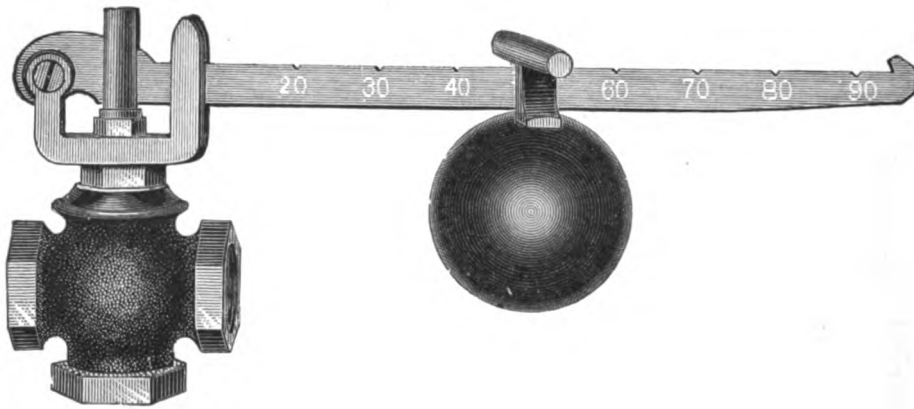
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$1 60	1 80	2 50	3 50	5 00	7 50	13 50	19 00

LIST ON U. S. IRON BODY THROTTLE VALVE.

Size	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Each	\$9 00	12 00	15 00	18 00	21 00

LIST ON STAR BRASS THROTTLE VALVE

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Each	\$2 50	3 00	4 00	5 00	7 00	10 00	19 00

GLOBE SAFETY VALVE.**Plate 204.****STEAM METAL.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Screwed, each	\$2 00	2 20	2 50	3 25	3 90	4 70	7 15	9 00	12 50	22 50	33 50

IRON BODY, BRASS MOUNTED.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8 in.
Screwed, each	\$3 50	4 00	5 00	5 80	7 80	13 25	17 25	23 00	28 75	34 50	41 50	57 75	132 00
Flanged, each	.....	5 50	6 75	7 75	10 25	16 00	21 50	27 50	34 00	40 00	48 00	65 00	140 00

LOW PRESSURE SAFETY VALVE.**Plate 205.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Each	\$1 50	2 25	3 00	4 00	5 50

ORME POP VALVE.

NO. 5.—ORME PATENT LOOK-UP POP SAFETY VALVES, ALL BRASS, PHOSPHOR BRONZE SEATS.

**Plate 206.**

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Price, each . . .	\$10 00	12 00	15 00	20 00
Size	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3 in.
Price, each . . .	\$30 00	35 00	45 00	60 00

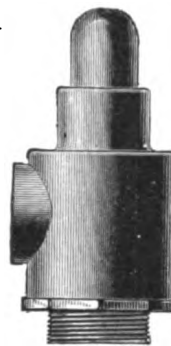
Top Outlet. For locomotives, fire engines, portable and hoisting engine boilers.

These Valves are provided with a lever to operate Valve or blow off all the steam when desired.

Flanged bases furnished if desired at a small advance in price. Prices do not include locks.

ORME RELIEF VALVE.

NO. 6.—ORME PATENT RELIEF VALVE, ALL BRASS, PHOSPHOR BRONZE SEATS.

**Plate 207.**

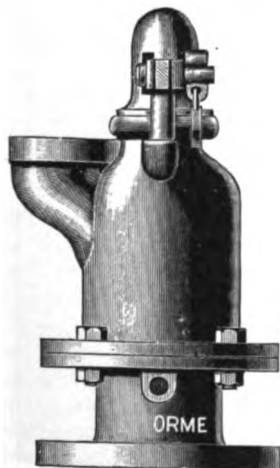
Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Price, each. . . .	\$10 00	12 00	15 00	20 00
Size	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3 in.
Price, each.	\$30 00	45 00	60 00	

Side Outlet. For fire engines, pumps, steam cylinders, or wherever a positive automatic relief is required.

Flanged bases furnished if desired at a small advance in price.

ORME POP VALVE.

NO. 1.—ORME PATENT MARINE AND STATIONARY LOOK-UP POP SAFETY VALVE, IRON BODY, PHOSPHOR BRONZE SEATS.

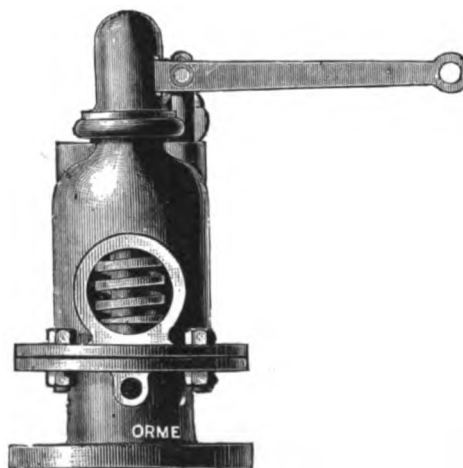
**Plate 208.**

Diameter . . .	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Price, each . .	\$30 00	40 00	50 00	60 00	75 00
Diameter . . .	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6 in.
Price, each, \$	90 00	100 00	110 00	125 00	140 00

Top outlet with lever for operating valve, or blowing off all steam when desired. The lever can stand in any desired position. All valves are both flanged and screwed on the bottom. Other sizes of flanges than the regular made to order.

ORME POP VALVE.

NO. 2.—ORME PATENT MARINE AND STATIONARY LOOK-UP POP SAFETY VALVE, IRON BODY, PHOSPHOR BRONZE SEATS.

**Plate 209.**

Diameter . . .	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Price, each . .	\$30 00	40 00	50 00	60 00	75 00
Diameter . . .	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6 in.
Price, each, \$	90 00	100 00	110 00	125 00	140 00

Side outlet with lever for operating valve or blowing off all the steam when desired. The lever can stand in any desired position. All valves are both flanged and screwed on the bottom. Other sizes of flanges than the regular made to order.

RICHARDSON'S POP SAFETY VALVES.

WITH SOLID NICKEL SEAT.



Plate 210.

WITH BRASS SEAT.



Plate 211.

WITH NICKEL SEAT.

Size, Inches	Diameter of Base Flange, Inches	Diameter of Side Outlet Screwed, Inches	Distance from Base Flange to center of Side Outlet, Inches	Total Height of Valve, including Lock-up Caps, Inches	Distance from center of Valve to outside of Outlet, Inches	Largest Diameter of Valve or Space Occupied, Inches	For Boilers, H. P.	Prices
1	Screwed	1 $\frac{1}{4}$	4	9 $\frac{7}{8}$	2 $\frac{3}{8}$	4 $\frac{1}{2}$	8 to 10	\$15 00
1 $\frac{1}{4}$	Screwed	1 $\frac{1}{2}$	4 $\frac{1}{4}$	11 $\frac{1}{8}$	2 $\frac{3}{8}$	5	10 to 15	20 00
1 $\frac{1}{2}$	Screwed	2	5 $\frac{1}{2}$	12	2 $\frac{7}{8}$	6 $\frac{1}{4}$	20 to 30	30 00
2	Screwed	2 $\frac{1}{2}$	6	14 $\frac{1}{4}$	3 $\frac{1}{2}$	7 $\frac{3}{8}$	35 to 50	40 00
2 $\frac{1}{2}$	9 $\frac{1}{8}$	3	7 $\frac{3}{4}$	17 $\frac{1}{4}$	4 $\frac{1}{4}$	8 $\frac{3}{4}$	60 to 75	55 00
3	9 $\frac{1}{8}$	3 $\frac{1}{2}$	8 $\frac{1}{2}$	18	5	9 $\frac{3}{8}$	75 to 100	75 00
3 $\frac{1}{2}$	10 $\frac{1}{4}$	4	9 $\frac{1}{8}$	20 $\frac{3}{4}$	5 $\frac{5}{8}$	10 $\frac{3}{8}$	100 to 125	87 00
4	11 $\frac{3}{8}$	4	9 $\frac{1}{4}$	21 $\frac{1}{4}$	6	11 $\frac{1}{8}$	125 to 150	100 00
4 $\frac{1}{2}$	12 $\frac{1}{2}$	4 $\frac{1}{2}$	10	22	6	12	150 to 175	125 00
5	13	5	10	23	6 $\frac{1}{4}$	12 $\frac{3}{4}$	175 to 200	150 00
5 $\frac{1}{2}$	13	10 $\frac{1}{2}$ flanged	11	36	12	19	200 to 275	165 00
6	14	10 $\frac{3}{4}$ flanged	.....	40	14 $\frac{3}{4}$	22 $\frac{1}{4}$	.....	175 00

WITH BRASS SEAT.

Diameter	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5 in.
H. P. . .	20 to 35	35 to 60	60 to 75	75 to 100	100 to 125	125 to 150	150 to 175	175 to 200
Price . .	\$25 00	35 00	45 00	60 00	75 00	90 00	95 00	100 00

In ordering, state size of boiler and highest working pressure.

LUNKENHEIMER'S IMPROVED POP SAFETY VALVE.

FOR STATIONARY, PORTABLE AND MARINE STEAM BOILERS.

ALL BRASS.



Plate 214.

IRON BODY. ANGLE OUTLET—SOREWED ENDS.

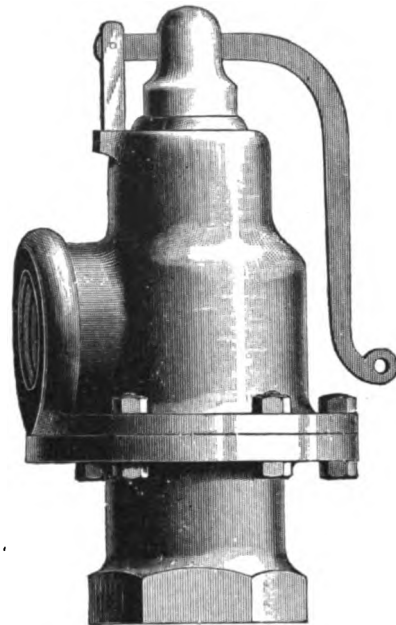


Plate 215.

Size Pipe	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Brass, Top Outlet, each	\$5 50	6 00	6 50	7 50	9 00	11 50	18 00	28 00	38 00
Brass, Side Outlet, each	5 50	6 00	6 50	7 50	9 00	11 50	18 00	28 00	38 00
Capacity for Boilers (H. P.)	3	5	8	10	15	20	30	60-75	75-100
Iron, Angle Outlet (Screwed or Flanged), each								\$32 00	40 00
Capacity for Boilers, Horse-Power								60-75	75-100

Unless otherwise specified, Top Outlet Valves will be sent set at 100 pounds.



Plate 212.

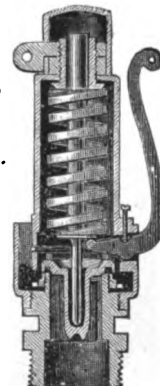
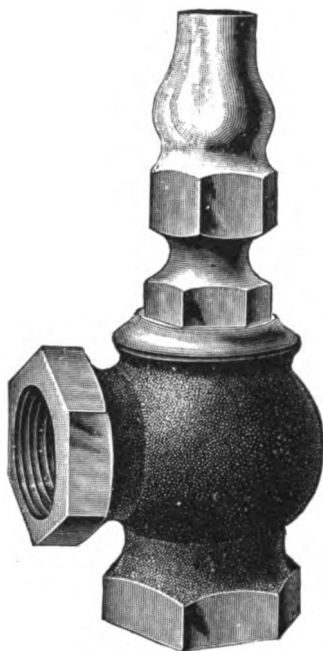
**RICHARDSON'S
POP SAFETY VALVES.**FOR PORTABLE
AND FARM ENGINE USE

Plate 213.

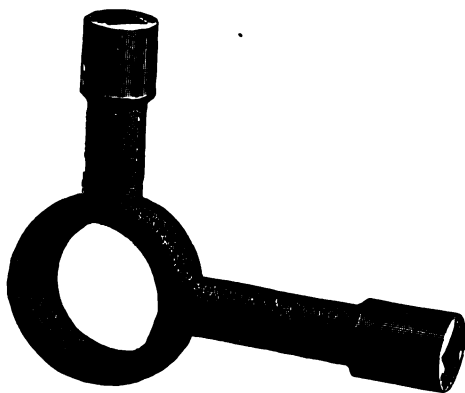
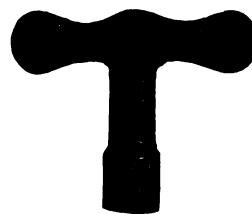
Size	Size, Steam Connection	Height	Largest Diameter	Horse Power	Price, without Locks
$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	$6\frac{1}{8}$ inch	$2\frac{3}{8}$ inch	8 to 10	\$ 8 00
1 inch	1 inch	$7\frac{1}{2}$ inch	$2\frac{1}{2}$ inch	12 to 15	10 00
$1\frac{1}{4}$ inch	$1\frac{1}{4}$ inch	$8\frac{1}{2}$ inch	$2\frac{1}{2}$ inch	18 to 20	15 00
$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	$9\frac{3}{8}$ inch	$3\frac{3}{8}$ inch	20 to 25	20 00
2 inch	2 inch	11 inch	$4\frac{1}{8}$ inch	30	30 00
$2\frac{1}{2}$ inch	$2\frac{1}{2}$ inch	13 inch	$5\frac{1}{4}$ inch	40	40 00

In ordering, state Horse-power, or size of Boiler, and highest working pressure.

RADIATOR VALVES.**BRASS DISCS.****WITH LOCK AND SHIELD.****Plate 218.**

Any of our Radiator Valves can be furnished with lock and shield, if so desired. List price is the same as with wood wheel.

When ordering, specify style of valve wanted by number, adding the words: lock and shield.

KEYS.**BRASS.****No. 1.****FOR LOCK AND SHIELD VALVES.****Plate 216.****No. 2.****Plate 217.**

	Plain	Plated
No. 1, for Valves $\frac{3}{4}$ to 2 inches, inclusive	\$0 15	0 20
No. 2, for Valves $\frac{3}{8}$ to $\frac{1}{2}$ inch, inclusive	05	07

RADIATOR VALVES.

WITHOUT UNION.

WOOD WHEEL.



Plate 219.

WITH UNION.

WOOD WHEEL.

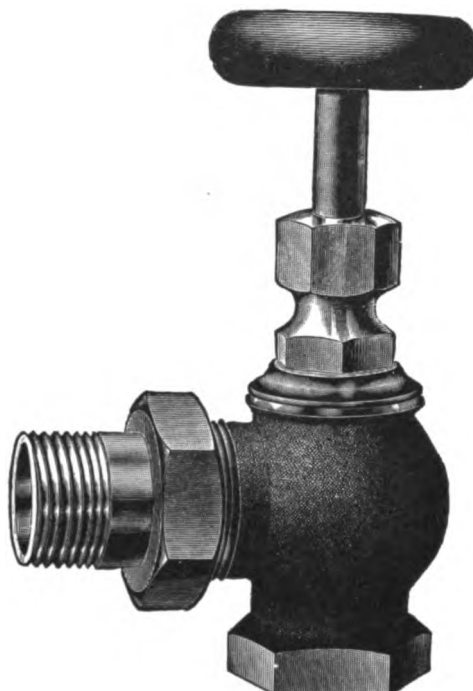


Plate 220.

ROUGH BODY.

WITH BRASS SEAT.

Size		$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2 in.
No. 4, Plain,	Female R. H. on side, Female R. H. on bottom, each	\$1 40	1 75	2 35	3 25	4 35	6 85
No. 5, N. P. Trims.,	Female R. H. on side, Female R. H. on bottom, each	1 60	2 00	2 65	3 55	4 65	7 35
No. 6, Full N. P.,	Female R. H. on side, Female R. H. on bottom, each	1 70	2 10	2 75	3 70	4 85	7 60
No. 7, Plain,	Female L. H. on side, Female R. H. on bottom, each	1 40	1 75	2 35	3 25	4 35	6 85
No. 8, N. P. Trims.,	Female L. H. on side, Female R. H. on bottom, each	1 60	2 00	2 65	3 55	4 65	7 35
No. 9, Full N. P.,	Female L. H. on side, Female R. H. on bottom, each	1 70	2 10	2 75	3 70	4 85	7 60
No. 10, Plain.,	Male Union on side, Female R. H. on bottom, each	2 15	2 50	3 30	4 40	5 90	9 25
No. 11, N. P. Trims.,	Male Union on side, Female R. H. on bottom, each	2 35	2 75	3 60	4 70	6 25	9 75
No. 12, Full N. P.,	Male Union on side, Female R. H. on bottom, each	2 50	2 90	3 75	5 00	6 50	10 00

WITH JENKINS' DISCS.

Size		$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2 in.
No. 16, Plain,	Female R. H. on side, Female R. H. on bottom, each	\$2 00	2 50	3 20	4 50	6 25	10 50
No. 17, N. P. Trims.,	Female R. H. on side, Female R. H. on bottom, each	2 25	2 70	3 50	4 75	6 50	10 75
No. 18, Full N. P.,	Female R. H. on side, Female R. H. on bottom, each	2 50	2 85	3 65	4 90	6 75	11 00
No. 19, Plain,	Female L. H. on side, Female R. H. on bottom, each	2 00	2 50	3 20	4 50	6 25	10 50
No. 20, N. P. Trims.,	Female L. H. on side, Female R. H. on bottom, each	2 25	2 70	3 50	4 75	6 50	10 75
No. 21, Full N. P.,	Female L. H. on side, Female R. H. on bottom, each	2 50	2 85	3 65	4 90	6 75	11 00
No. 22, Plain,	Male Union on side, Female R. H. on bottom, each	2 75	3 50	4 30	5 85	7 75	12 60
No. 23, N. P. Trims.,	Male Union on side, Female R. H. on bottom, each	3 00	3 75	4 65	6 25	8 00	12 85
No. 24, Full N. P.,	Male Union on side, Female R. H. on bottom, each	3 20	3 80	4 75	6 40	8 10	13 10

When ordering, always use valve numbers and sizes.

CORNER RADIATOR VALVES

WITH JENKINS' DISCS.

WOOD WHEELS.

RIGHT HAND VALVE.

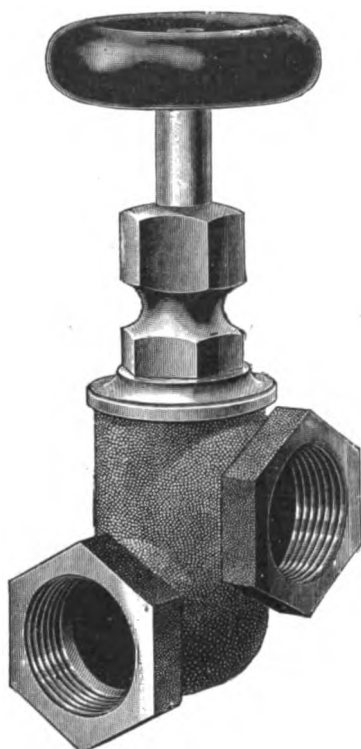


Plate 221.

LEFT HAND VALVE.

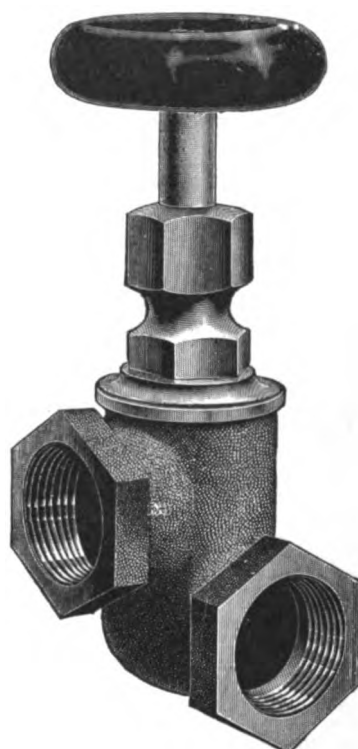


Plate 222.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
No. 31, Rough Body, Finished Trimmings, each	\$2 75	3 50	5 00	7 00	11 55
No. 32, Rough Body, Plated Trimmings, each	3 00	3 85	5 25	7 25	11 85
No. 33, Rough Body, Plated all over, each	3 15	4 00	5 50	7 50	12 10
No. 34, Finished all over, each	3 40	4 25	5 75	8 00	13 05
No. 35, Finished and Plated all over, each	3 80	4 75	6 25	8 50	13 60

WITH UNION.

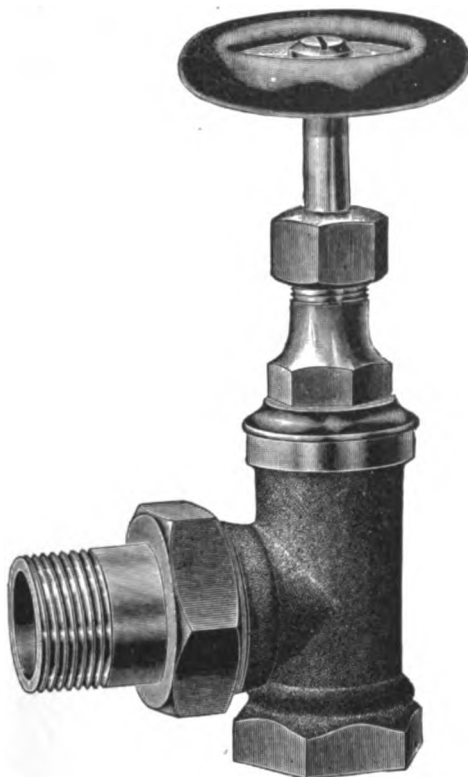
Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
No. 36, Rough Body, Finished Trimmings, each	\$3 85	4 75	6 45	8 55	13 85
No. 37, Rough Body, Plated Trimmings, each	4 15	5 15	6 90	8 80	14 15
No. 38, Rough Body, Plated all over, each	4 20	5 25	7 05	8 95	14 45
No. 39, Finished all over, each	4 50	5 50	7 20	9 55	15 35
No. 40, Finished and Plated all over, each	4 85	6 00	7 80	9 95	15 95

All corner valves are tapped left hand in both openings.

Valves fitted with lock and shield at same list; keys extra.

HOT WATER RADIATOR VALVE.

QUARTER-TURN, QUICK-OPENING.

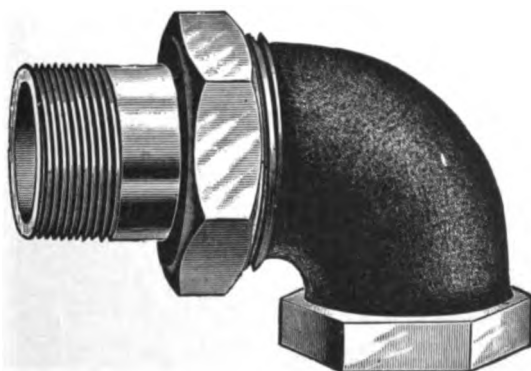
**Plate 223.**

ROUGH BODY.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Hot Water Radiator Valve, with Union, Plain, each	\$2 00	2 50	3 50	5 00	7 50
Hot Water Radiator Valve, with Union, Plated all over, each	2 40	3 00	4 10	5 60	8 25

UNION ELBOW.

BRASS.

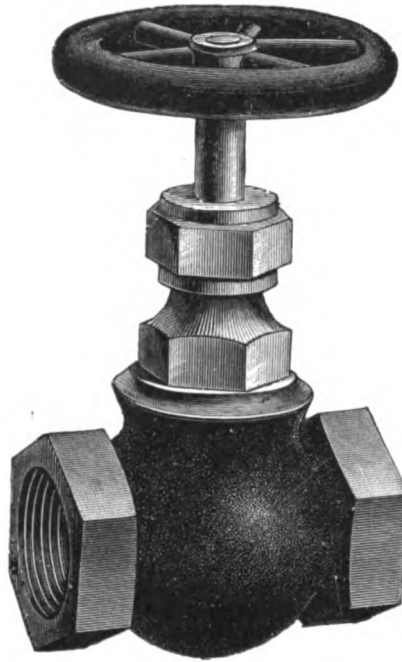
**Plate 224.**

ROUGH BODY.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Brass Union Ells, Plain, each	\$1 25	1 60	2 15	2 85	4 50
Brass Union Ells, Plated all over, each	1 50	1 85	2 40	3 15	4 80

GLOBE VALVE.

STEAM METAL.

**Plate 225.**

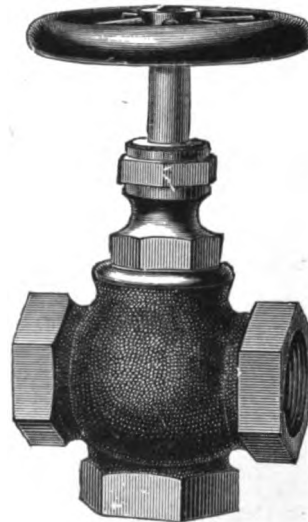
Size . .	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Each . .	\$0 72	72	77	1 00	1 26	1 80	2 52	3 50	5 30	10 00	14 40	26 50	36 00

ANGLE VALVE.

STEAM METAL.

**Plate 226.****CROSS VALVE.**

STEAM METAL.

**Plate 227.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Angle Valves, ea .	\$0 72	72	77	1 00	1 26	1 80	2 52	3 50	5 30	10 00	14 40	26 50	36 00
Cross Valves, ea .	.....	1 25	1 25	1 50	2 00	2 50	3 50	5 00	8 00	16 00	24 00	45 00	60 00

LUNKENHEIMER'S PATENT REGRINDING GLOBE AND ANGLE VALVES.

GLOBE VALVE.

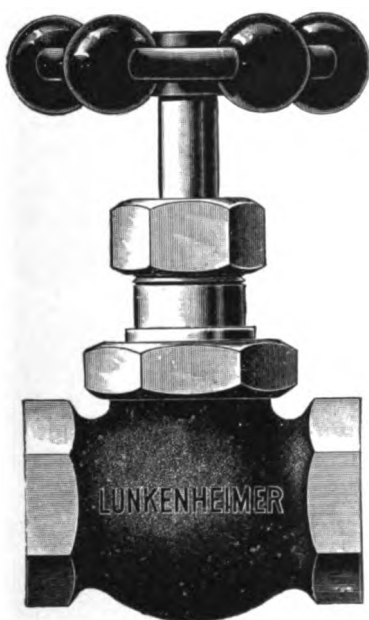


Plate 228.

ANGLE VALVE.



Plate 229.

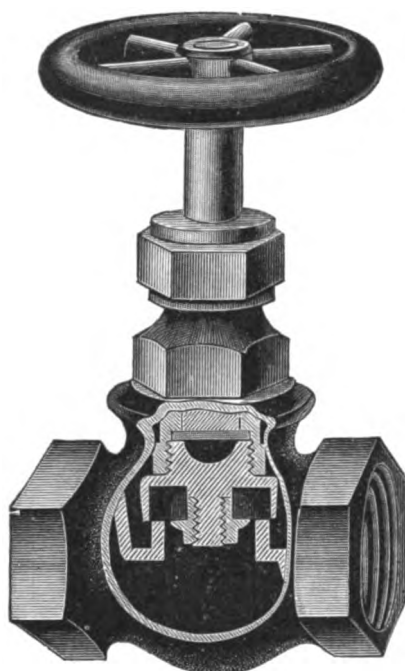
To regrind, unscrew the nut and place a little powdered sand and soap on disc. Insert a wire through hole in disc to hold it to stem, and regrind, leaving the nut unscrewed, so that the hub rotates and guides the stem while regrinding.

All genuine valves have Lunkenheim and (S) cast in the valve-shell and a direction tag attached.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Globe Valves, each	\$0 70	70	85	1 15	1 45	2 00	2 80	3 90	6 20	12 00	16 50
Angle Valves, each	70	70	85	1 15	1 45	2 00	2 80	3 90	6 20	12 00	16 50
Finished all over, with Brass Wheel	} each 1 75 1 90 2 15 2 50 3 10 3 65 5 25 7 25 10 75 22 00 33 50										
Cross Valves, each . . . . .	.....	.....	1 00	1 50	2 00	2 70	3 50	5 10	8 00	16 00	24 00

JENKINS' PATENT VALVE.

STEAM METAL.

**Plate 230.**

Size										
Globe and Angle Valves, Steam Metal, each	1/4	3/8	1/2	3/4	1 in.					
	\$1 10	1 25	1 60	2 20	2 80					
Size										
Globe and Angle Valves, Steam Metal, each	1 1/4	1 1/2	2	2 1/2	3 in.					
	\$4 00	5 50	8 00	15 75	22 00					
Size										
Check Valves, each	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3 in.
	\$1 10	1 20	1 30	1 90	2 60	3 60	5 00	7 50	13 50	20 50

IRON BODY, BRASS MOUNTED.

Size										
Globe and Angle Valves, Brass Hub, Screwed	2	2 1/2	3	3 1/2	4	5 in.				
	\$ 7 25	11 00	16 00	.....	.....	.....	
Globe and Angle Valves, Brass Hub, Flanged		8 50	13 00	18 00	.....	.....		
Globe and Angle Valves, with Yoke, Screwed	10 00	12 00	16 75	19 50	24 00	40 00				
Globe and Angle Valves, with Yoke, Flanged	11 75	14 00	18 50	21 50	28 00	42 00				
Cross Valves, Screwed	.....	16 00	21 00	28 00	30 00	45 00				
Cross Valves, Flanged	.....	19 00	24 00	29 00	33 00	48 00				
Size										
Globe and Angle Valves, with Yoke, Screwed	6	7	8	10	12 in.					
	\$48 00	80 00	90 00	130 00	185 00					
Globe and Angle Valves, with Yoke, Flanged		50 00	80 00	90 00	130 00	185 00				
Cross Valves, Screwed	.....	58 00	.....	.....	.....	.....
Cross Valves, Flanged	.....	62 00	.....	.....	.....	.....

JENKINS' DISCS.

The Jenkins' Discs will stand any and all pressures of Steam, Oils or Acids.

Reduced Price List of Jenkins' Discs for Valves:

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2 in.
Price, net, each	\$0 03	04	04	05	06	09	12	18
Size	2 1/2	3	3 1/2	4	5	6	7	8 in.
Price, net, each	\$0 24	33	45	52	68	90	98	1 05
Size	10	12	14	16	18	20	24 in.	
Price, net, each	\$1 50	2 00	3 00	4 00	5 00	6 00	9 00	

**Plate 231.**

POWELL'S PATENT IMPROVED REGRINDING STAR GLOBE, ANGLE AND CHECK VALVES.

SPECIAL STEAM METAL.

ANGLE VALVE.

NEW PATTERN GLOBE VALVE.

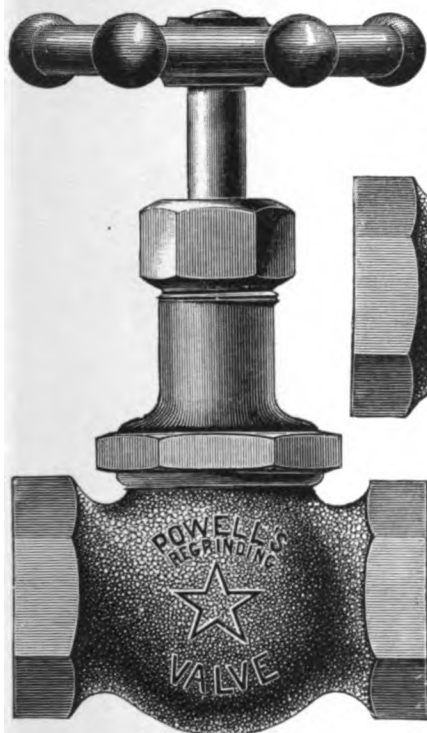


Plate 232.

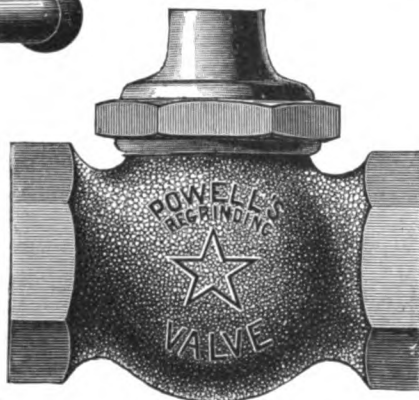
CHECK VALVE,
HORIZONTAL.

Plate 233.

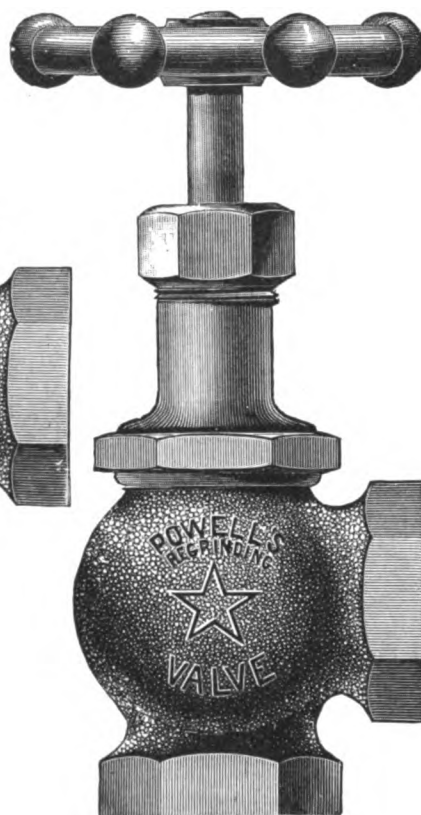


Plate 234.

NEW PATTERN GLOBE VALVE—PLATE 232.

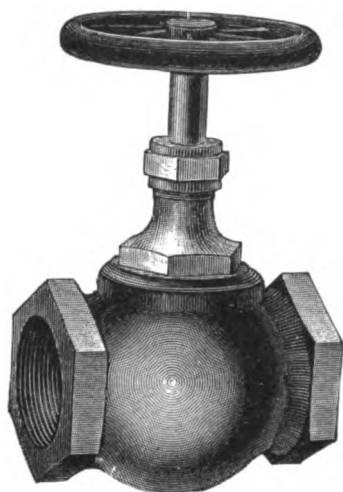
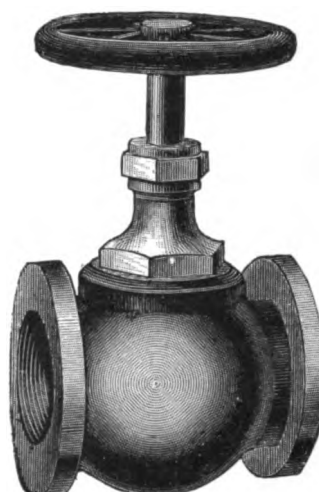
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1 in.
Plate 232, each	\$0 80	85	90	1 20	1 55	2 00
Plate 232, Finished all over, with Iron Wheel, each	1 50	1 60	1 75	2 10	2 50	3 00
Plate 232, Finished all over, with Brass Wheel, each	1 75	1 90	2 15	2 50	3 10	3 65
Size	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.	.....
Plate 232, each	\$3 00	4 00	6 50	12 50	19 00	.....
Plate 232, Finished all over, with Iron Wheel, each	4 25	5 75	9 25	20 00	31 00	.....
Plate 232, Finished all over, with Brass Wheel, each	5 25	7 25	10 75	22 00	33 50	.....

ANGLE VALVE—PLATE 234.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1 in.
Plate 234, each	\$0 80	85	90	1 20	1 55	2 00
Plate 234, Finished all over, with Iron Wheel, each	1 50	1 60	1 75	2 10	2 50	3 00
Plate 234, Finished all over, with Brass Wheel, each	1 75	1 90	2 15	2 50	3 10	3 65
Size	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.	.....
Plate 234, each	\$3 00	4 00	6 50	12 50	19 00	.....
Plate 234, Finished all over, with Iron Wheel, each	4 25	5 75	9 25	20 00	31 00	.....
Plate 234, Finished all over, with Brass Wheel, each	5 25	7 25	10 75	22 00	33 50	.....

CHECK VALVE, HORIZONTAL—PLATE 233.

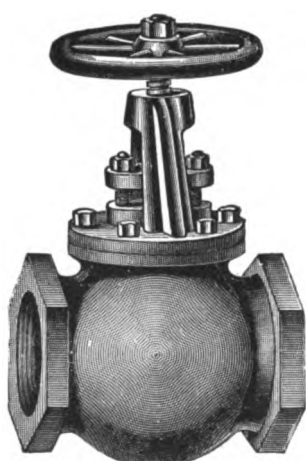
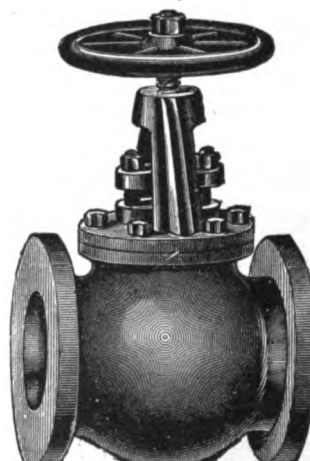
Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1 in.
Plate 233, Horizontal, each	\$0 70	70	75	95	1 20	1 65
Plate 233, Angle, each	70	70	75	95	1 20	1 65
Plate 233, Finished all over	1 40	1 45	1 60	1 85	2 15	2 65
Size	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.	.....
Plate 233, Horizontal, each	\$2 50	3 25	5 00	11 00	15 00	.....
Plate 233, Angle, each	2 50	3 25	5 00	11 00	15 00	.....
Plate 233, Finished all over	3 75	5 00	7 75	18 50	27 00	.....

IRON BODY GLOBE VALVES.**BRASS MOUNTED, PLAIN.****SCORED.****Plate 235.****FLANGED.****Plate 236.****SCORED.**

Size	1	1 1/4	1 1/2	2	2 1/2	3 in.
Each	\$2 25	2 75	3 50	5 40	7 35	9 80

FLANGED.

Size	1	1 1/4	1 1/2	2	2 1/2	3 in.
Each	\$3 25	3 85	4 80	7 00	9 00	12 50

BRASS MOUNTED, WITH YOKE.**SCORED.****Plate 237.****FLANGED.****Plate 238.****SCORED.****WITH YOKE.**

Size . . .	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12 in.
Each . .	\$7 00	9 00	12 50	15 25	19 00	24 00	27 00	37 50	63 00	72 00	114 00	170 00

FLANGED.**WITH YOKE.**

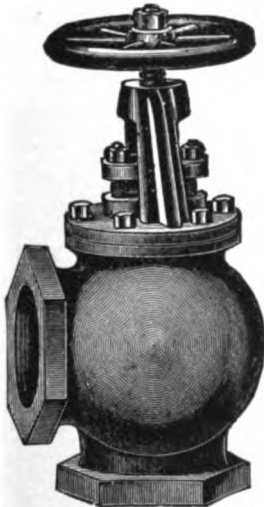
Size . . .	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12 in.
Each . .	\$8 60	10 75	15 00	18 50	22 50	27 50	31 00	42 00	68 00	77 00	123 00	187 00

IRON BODY ANGLE VALVES.**BRASS MOUNTED, PLAIN.****SCOREWED.****Plate 239.****FLANGED.****Plate 240.****SCOREWED.**

Size	1	1 1/4	1 1/2	2	2 1/2	3 in.
Each	\$2 25	2 75	3 50	5 40	7 35	9 80

FLANGED.

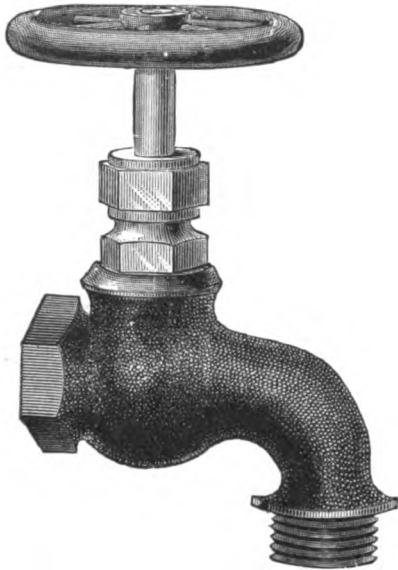
Size	1	1 1/4	1 1/2	2	2 1/2	3 in.
Each	\$3 25	3 85	4 80	7 00	9 00	12 50

BRASS MOUNTED, WITH YOKE.**SCOREWED.****Plate 241.****FLANGED.****Plate 242.****SCOREWED, WITH YOKE.**

Size	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12 in.
Each	\$7 00	9 00	12 50	15 25	19 00	24 00	27 00	37 50	63 00	72 00	114 00	170 00

FLANGED, WITH YOKE.

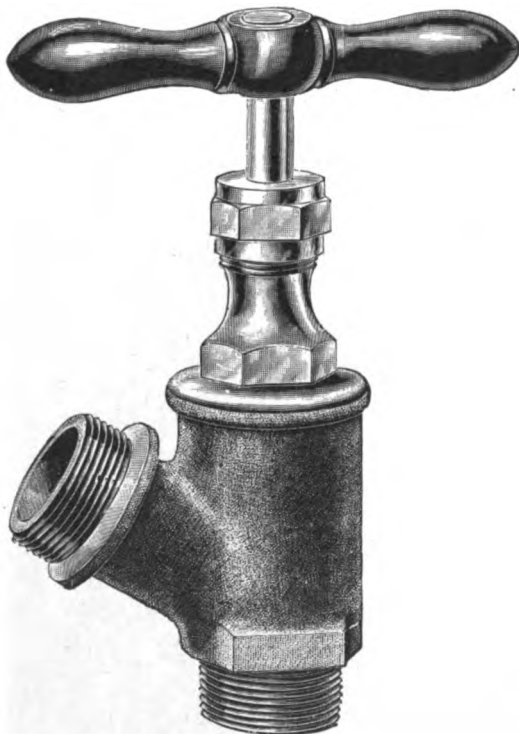
Size	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10	12 in.
Each	\$8 60	10 75	15 00	18 50	22 50	27 50	31 00	42 00	68 00	77 00	123 00	187 00

HOSE VALVES.**GLOBE PATTERN.****Plate 243.**

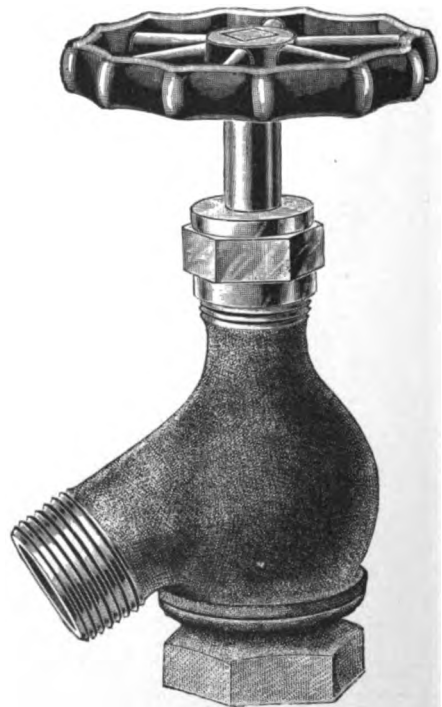
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Each	\$1 50	2 25	3 00	4 50	6 75	8 00	15 00

ANGLE PATTERN.**Plate 244.**

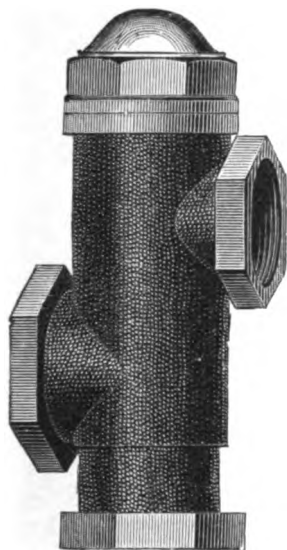
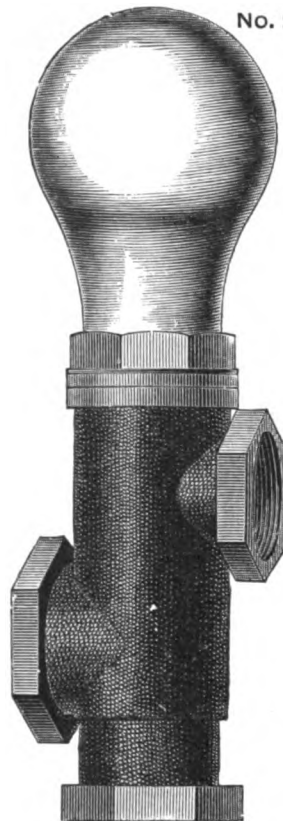
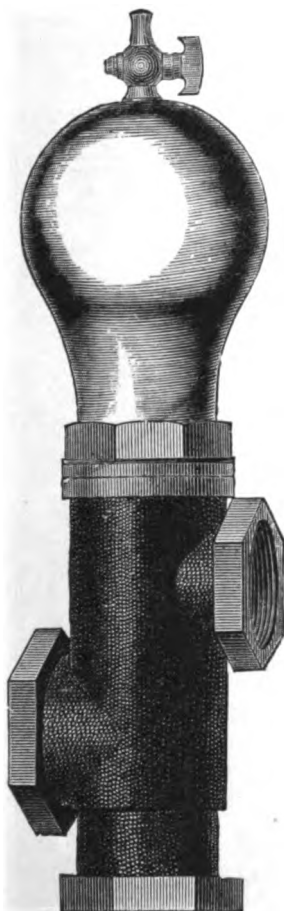
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Each	\$1 50	2 25	3 00	4 50	6 75	8 00	15 00

CHICAGO PATTERN.**Plate 245.**

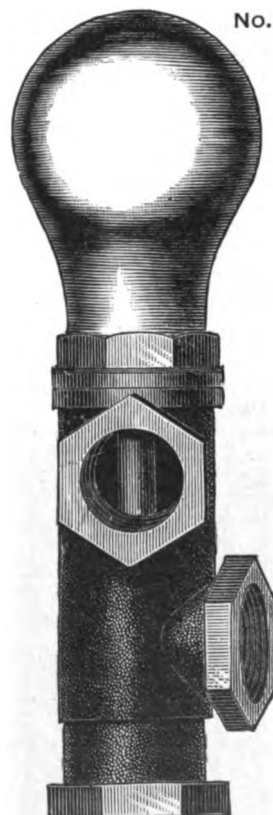
Size . . .	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Each . .	\$3 15	3 70	4 75	7 00	8 50

CALIFORNIA PATTERN.**Plate 246.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Each	\$1 65	1 65	2 20	3 40	4 75	7 00

PUMP VALVES.**No. 1.****Plate 247.****No. 2.****Plate 248.****STEAM METAL.****No. 4.****Plate 249.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
No. 1	\$2 00	3 00	4 00	6 00	9 00
No. 2	2 50	3 50	5 00	7 25	10 50
No. 3	2 50	3 50	5 00	7 25	10 50
No. 4	3 00	4 00	5 50	7 75	11 00

No. 3.**Plate 250.**

STANDARD GATE VALVES.

HUB END, IRON BODY, BRASS MOUNTED.

STEAM METAL.

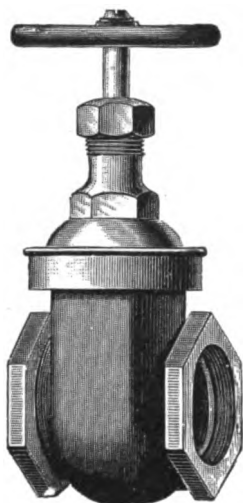


Plate 251.

IRON BODY, BRASS MOUNTED

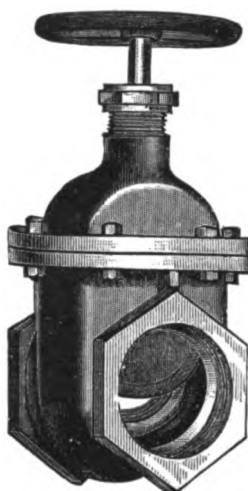


Plate 252.

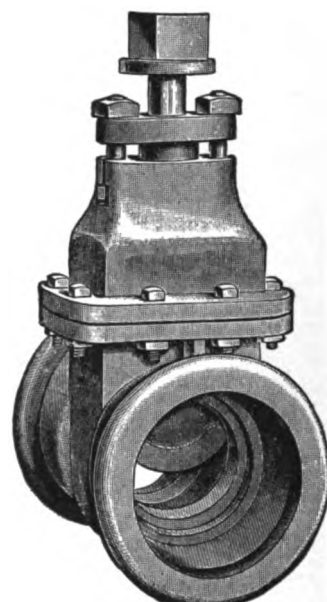


Plate 253.

STEAM METAL—PLATE 251.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Screwed Ends, each	\$1 30	1 75	2 50	3 50	5 00	7 50
Flanged Ends, each	.....	.....	.....	.....	.....	15 00
Diameter of Flanges	.....	.....	.....	.....	.....	6 in.
Face to Face, Screwed Ends	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$ in.
Face to Face, Flanged Ends	.....	.....	.....	.....	.....	$5\frac{1}{8}$ in.
Size	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 in.
Screwed Ends, each	\$15 00	22 00	.....	.....	.....	.....
Flanged Ends, each	25 00	30 00	.....	.....	.....	.....
Diameter of Flanges	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11 in.
Face to Face, Screwed Ends	$4\frac{1}{2}$	$4\frac{7}{8}$	$6\frac{1}{4}$	$6\frac{3}{4}$	.....	.....
Face to Face, Flanged Ends	$6\frac{3}{8}$	$7\frac{1}{8}$	$7\frac{3}{4}$	$8\frac{1}{2}$	$8\frac{3}{4}$	$10\frac{3}{8}$ in.

IRON BODY DOUBLE GATE VALVES, BRASS MOUNTED—PLATE 252.

Diameter of Opening	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7 in.
Face to Face, Screw Ends	$5\frac{1}{8}$	6	$6\frac{1}{8}$	$6\frac{3}{4}$	$7\frac{1}{8}$	$7\frac{1}{2}$	8	$8\frac{1}{4}$	10 in.
Face to Face, Flange Ends	$5\frac{5}{8}$	$6\frac{1}{8}$	$7\frac{1}{2}$	$7\frac{3}{4}$	$8\frac{1}{8}$	$8\frac{1}{2}$	$9\frac{1}{8}$	$9\frac{3}{8}$	$9\frac{1}{2}$ in.
Diameter of Flanges	6	7	8	$8\frac{1}{2}$	9	$9\frac{1}{2}$	10	11	12 in.
Diameter of Opening	8	10	12	14	15	16	18	20	24 in.
Face to Face, Screw Ends	$10\frac{1}{4}$	.....	.....	.....	.....	.....	.....	.....	.....
Face to Face, Flange Ends	11	$12\frac{1}{8}$	$13\frac{1}{8}$	$13\frac{3}{4}$	.....	14	$14\frac{7}{8}$	$15\frac{1}{2}$	17 in.
Diameter of Flanges	13	16	18	21	.....	23	25	27	31 in.
Size	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	10 in.
Screw Ends, each	\$ 8 50	12 00	15 00	18 00	20 00	22 50	25 00	30 00	40 00
Flange Ends, each	9 00	12 50	15 50	19 00	21 00	24 00	27 00	32 00	40 00
Sliding Stem and Lever	11 00	14 75	18 00	21 50	24 00	27 00	30 00	36 00	47 00
Screw Ends, each	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sliding Stem and Lever	11 50	15 25	18 50	22 50	25 00	28 50	32 00	38 00	47 00
Flange Ends, each	.....	.....	.....	.....	.....	.....	.....	.....	.....

HUB END, IRON BODY, BRASS MOUNTED—PLATE 253.

Size	3	4	5	6	7	8	10	12	14	16	18	20	24 in.
End to End of Pipe when Laid in Hub	$3\frac{1}{4}$	4	5	5	$4\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{3}{4}$	$7\frac{1}{4}$	8	$6\frac{1}{2}$	6	9	10 in.
Diameter of Hub Socket	$4\frac{3}{8}$	$5\frac{3}{4}$	$6\frac{1}{8}$	$7\frac{1}{8}$	$8\frac{3}{8}$	10	12	$14\frac{1}{4}$	$16\frac{1}{4}$	$18\frac{1}{2}$	$20\frac{1}{2}$	$22\frac{3}{4}$	$26\frac{3}{4}$ in.
Size	3	4	5	6	7	8	10	12	14	16	18	20	24 in.
Hub or Spigot End, each	\$15 00	20 00	25 00	30 00	30 00	40 00	40 00	50 00	50 00	65 00	65 00	90 00	90 00

When ordering, state if Valves should open by turning to the left or to the right; when not mentioned, we send Valves which open by turning to the left.

STATIONARY SPINDLE.

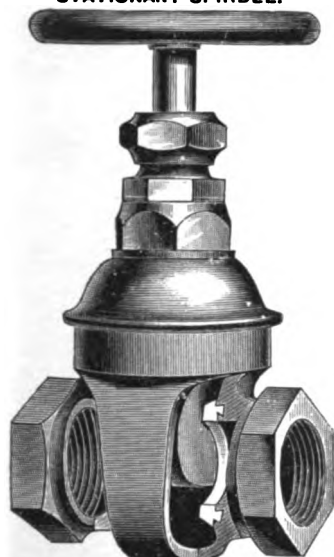


Plate 254.

RISING SPINDLE.

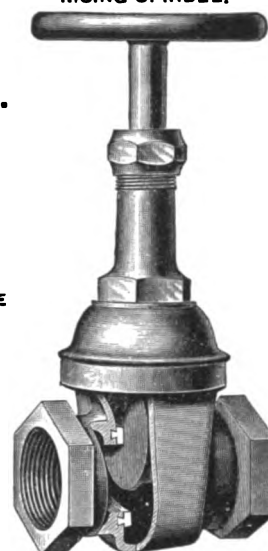


Plate 255.

CHAPMAN GATE VALVES.

WITH EITHER SCREW OR FLANGE ENDS.

EITHER STATIONARY SPINDLE, RISING SPINDLE
OR SLIDING SPINDLE AND LEVER.**COMPOSITION STEAM AND WATER
VALVES.**

WITH BABBITT METAL SEATS.

Diameter of Opening	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4 in.
Face to Face, Screw Ends . . .	2 1/4	2 1/2	2 3/8	2 3/4	3 3/8	3 1/2	4 1/8	4 3/4	5 1/8	6 3/8	8 3/8	8 1/2 in.
Face to Face, Flange Ends . . .	2 1/2	2 1/2	2 1/2	3	3 1/4	3 1/2	4 1/2	5 1/4	5 3/4	7	8 1/4	8 7/8 in.
Diameter of Flanges	2 1/2	2 1/2	3	3	4	4 1/2	5	6	7	7	8 1/2	9 in.
Finished Weight, Screw Ends . .	1 1/4	1 1/4	1 1/2	2 1/4	3 1/4	4 3/4	6	9 3/4	16	22 1/2	40	54 lbs.
Finished Weight, Flange Ends . .	1 1/2	1 1/2	2 1/4	3 1/4	4 3/4	7 1/4	9	14 1/2	22	29 1/2	50	63 lbs.
Screw End, each	\$1 20	1 20	1 30	1 75	2 25	3 25	4 25	6 25	11 50	16 00	30 00	38 00
Flange End, each	2 25	2 25	2 50	3 00	4 00	5 00	7 50	10 00	16 00	20 00	39 00	46 00
Sliding Stem and Lever, extra . .	75	75	1 00	1 20	1 40	1 60	1 80	2 00	2 25	2 50	2 75	3 00

Notice Weights and Dimensions of our Valves.

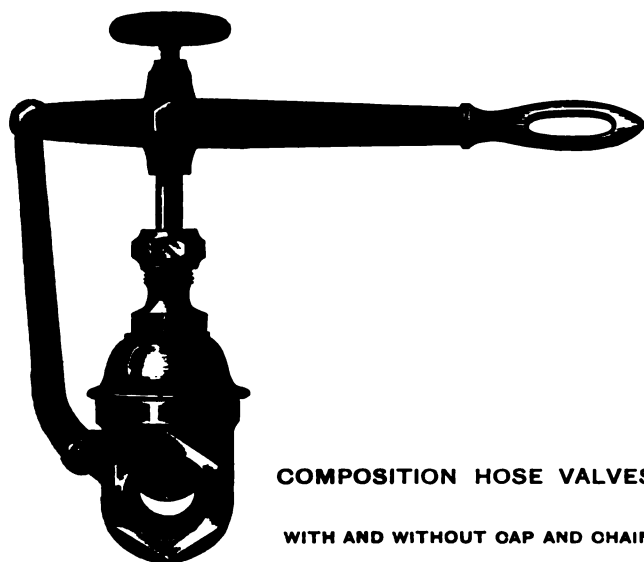


Plate 256.

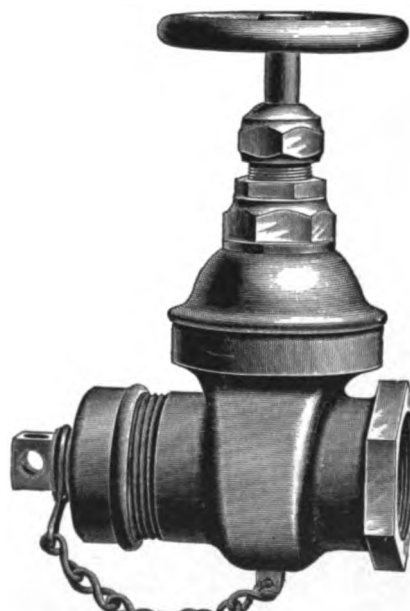
COMPOSITION HOSE VALVES,WITH AND WITHOUT CAP AND CHAIN
FOR HOSE END.

Plate 257.

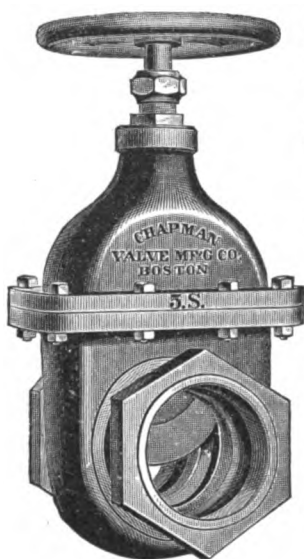
Unless otherwise ordered we shall cut thread on Hose End (our standard) full V, as follows:

Diameter of Opening	3/4	1	1 1/4	1 1/2	2	2 1/2	3 in.
Outside Diameter Thread on Hose End . .	1 1/4	1 1/2	1 3/4	1 3/4	2 1/4	3 1/4	3 3/8 in.
Diameter Bottom, Thread on Hose End . .	1 1/4	1 1/2	1 3/4	1 3/4	2 1/4	3 1/4	3 3/8 in.
Number Threads per inch, Hose End . . .	11	11	11	11	7 1/2	7	7
Without Cap and Chain, each	\$1 75	2 25	3 25	4 25	6 25	11 50	16 00
Finished Brass Cap and Chain, extra, each .	1 00	1 25	1 35	1 50	1 75	2 50	3 50

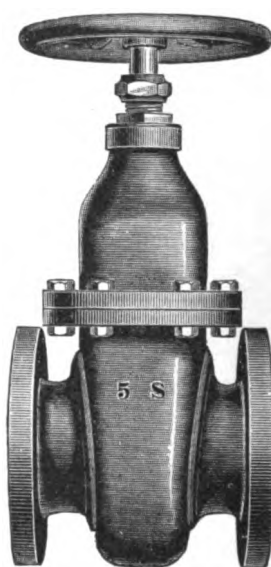
Notice Weights and Dimensions of our Valves.

IRON BODY, BOLTED TOP STEAM AND WATER VALVES.**SPECIAL BABBITT METAL SEATS, COMPOSITION MOUNTINGS, SREW OR FLANGED END.**

Sizes 2½ to 48 inches, inclusive.

**Plate 258.**

Diam. Opening, Inches.	Face to Face, Screw Ends, Inches.	Face to Face, Flange Ends, Inches.	Diam. Flanges, Inches.	Fin. Wt., Screw Ends, Lbs.	Finished Wt., Flange Ends, Lbs.	Screw Ends, Each.	Flange Ends, Each.	Sliding Stem and Lever extra, Each.
2½	6⅝	7⅞	7	28	40	\$10 00	\$10 00	\$2 25
3	7⅞	8¼	7	40	49	13 00	13 00	2 50
3½	8⅝	8⅞	8½	55	71	16 50	17 00	2 75
4	9⅝	9⅞	9	71	82	19 00	18 50	3 00
4½	9¾	10¼	9½	99	90½	23 00	22 00	.....
5	10¼	10⅞	10	120	132	25 00	24 00	.....
6	11⅝	10⅞	11	166	183	32 00	31 00	.....
7	12⅞	11½	12	225	235	38 00	37 00	.....
8	12½	11⅞	13	270	266	48 00	45 00	.....
9	13⅞	12⅞	15	...	385	.....	61 00	.....
10	13⅞	13⅞	16	...	442	.....	64 00	.....
12	.....	14⅞	18	...	620	.....	86 00	.....
14	.....	15⅞	21	...	870	.....	.....	.....
15	.....	16⅞	22	...	1,000	.....	.....	.....
16	.....	18¼	23	...	1,140	.....	.....	.....
18	.....	20	25	...	1,525	.....	.....	.....
20	.....	21	27	...	1,925	.....	.....	.....
22	.....	22½	29	...	2,370	.....	.....	.....
24	.....	24	31	...	3,159	.....	.....	.....

**Plate 259.**

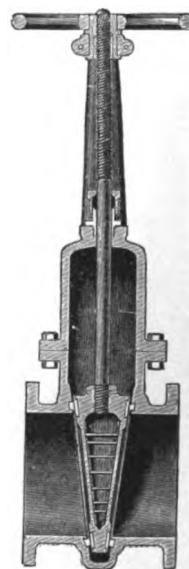
These Flanges fit together with a metal joint, no gasket or packing being used. The larger sizes can be fitted with either bevel or upright gearing, as desired. Large sizes fitted with bolt gland stuffing boxes.

IRON BODY VALVES FOR WATER AND STEAM.**WITH OUTSIDE SREW AND YOKE, WITH SPECIAL BABBITT SEATS.**

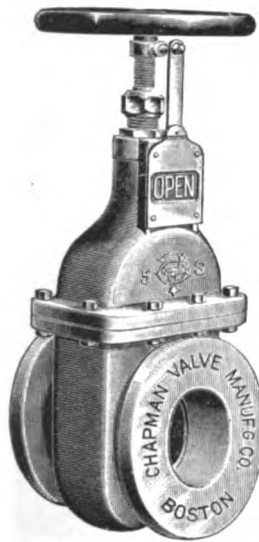
Sizes, 2½ to 48 inches, inclusive.

**Plate 260.**

Diameter of Opening, Inches.	Face to Face, Screw Ends, Inches.	Face to Face, Flange Ends, Inches.	Diameter of Flanges, Inches.	Finished Wt., Screw Ends, Lbs.	Finished Weight, Flange Ends, Lbs.	Screw Ends, Each.	Flange Ends, Each.
2½	6⅝	7⅞	7	41	52	\$20 75	\$ 20 75
3	7⅞	8¼	7	52	61	23 75	23 75
3½	8⅝	8⅞	8½	70	86	28 75	29 25
4	9⅝	9⅞	9	89	100	33 50	33 00
4½	9¾	10¼	9½	147	139	40 50	39 50
5	10¼	10⅞	10	156	168	46 75	45 75
6	11⅝	10⅞	11	197	214	55 75	54 75
7	12⅞	11½	12	258	268	65 50	64 50
8	12½	11⅞	13	340	336	83 00	80 00
9	13⅞	12⅞	15	...	457	.....	96 00
10	13⅞	13⅞	16	...	514	.....	110 00
12	.....	14⅞	18	...	667	.....	135 00
14	.....	15⅞	21	...	934	.....	.....
15	.....	16⅞	22	...	1,112	.....	.....
16	.....	18¼	23	...	1,276	.....	.....
18	.....	20	25	...	.....	.....	.....
20	.....	21	27	...	.....	.....	.....
22	.....	22½	29	...	.....	.....	.....
24	.....	24	31	...	.....	.....	.....

**Plate 261.**

On the medium and larger sizes of Steam or Water Valves that are opened and closed often in use, as throttles, etc., it has been found desirable to have the screw on the outside of the valve, where it can be readily cleaned and oiled. To meet the demand for this class of Valves, we have completed a line of patterns having outside Screws and Yokes, with Wheels stationary vertically. This form of construction can be applied to any of our regular kinds and sizes of Iron Body Valves, and has already met with a large demand from gas companies all over the country. We desire to call special attention to the fact that, by the Spindle advancing through Wheel, we obtain a Positive Indicator, as it clearly shows whether Valve be partially or fully open or entirely closed.



CHAPMAN IRON BODY STEAM AND WATER VALVES. WITH INDICATOR.

Diameter of Opening, Inches	Face to Face Screw Ends, Inches	Face to Face, Flange Ends, Inches	Diameter of Flanges, Inches	Height, Center Port to Top Wheel, Inches	Finished Weight, Screw Ends, Pounds	Finished Weight, Flange Ends, Pounds	Screw Ends, Each	Flange Ends, Each
2½	6⅝	7⅞	7	13	32	44	\$17 00	\$17 00
3	7½	8¾	7	14¼	44	52	20 25	20 25
3½	8¾	8⅞	8½	15¾	58	74	24 00	24 50
4	9⅝	9¾	9	16½	77	88	27 00	26 50
4½	9¾	10¼	9½	19¼	105	97	31 50	30 50
5	10¼	9⅝	10	21¼	128	136	33 50	32 50
6	11¾	10⅞	11	23¾	174	195	41 25	40 25
7	12½	11½	12	25½	234	244	48 00	47 00
8	12½	11¾	13	28¼	280	276	58 00	55 00
9	13½	12⅞	15	29⅞	.....	393	.....	73 50
10	.....	13⅝	16	32¼	.....	453	.....	76 50
12	.....	14⅝	18	36½	.....	633	.....	98 50

Notice Weights and Dimensions of our Valves.

Plate 262.

To meet a long-felt need of having valves indicate their position of being either shut or open, we invite your attention to our Patent Valve Indicator, which can be furnished with new valves or the parts sent to be attached to Chapman Valves already in use. As an indicator we claim for it, as being a simple and reliable device which will work at all times, having no parts which can be disarranged, and always working in unison with Plug (or Gate).

Especially for water service in cotton, woolen and other mills, or any place where automatic or other sprinkler pipes are used we guarantee satisfactory results.

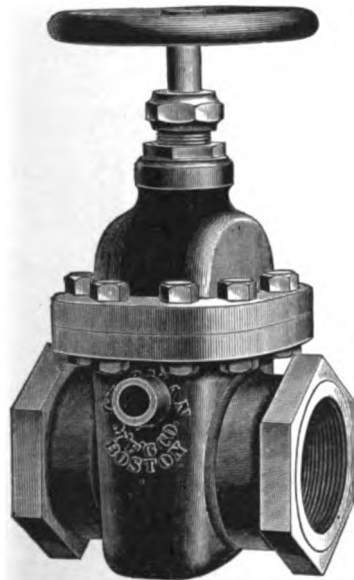


Plate 263.

CHAPMAN AUTOMATIC DRIP VALVES.

In many cases it is necessary to drain the water from a pipe, after the supply has been cut off by closing the main valve. To accomplish this it has heretofore been necessary to put a T into the pipe with a valve on it that had to be opened after the main valve was closed. This method is expensive, troublesome, and not sure, as the existence of the drain valve is sometimes forgotten, especially if underground. To obviate these troubles we have recently incorporated into our valve an Automatic Drip, for purposes where drip is desirable in a valve. This drip is the same as applied to our hydrants; and has met with an unusual degree of approval by all parties who have used them.

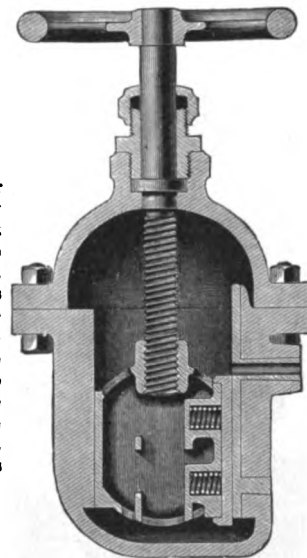
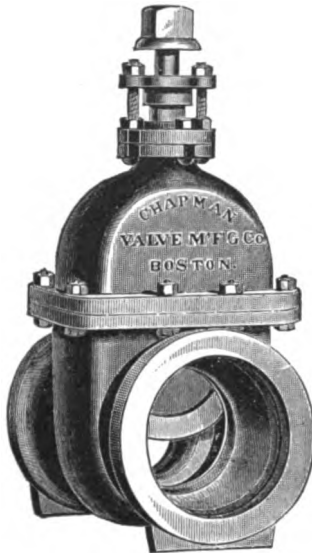
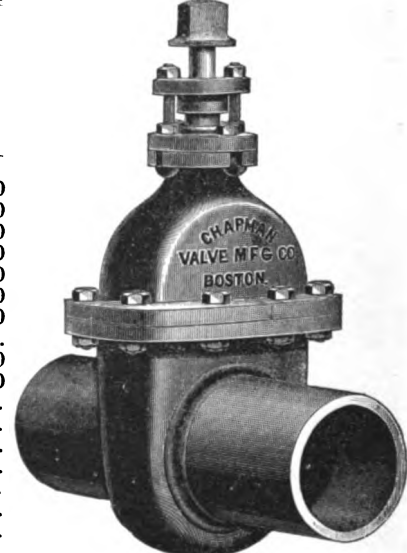


Plate 264.

Diam. of Opening .	COMPOSITION.		IRON BODY.									
	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 in.
Screw Ends	\$4 00	5 00	5 80	7 00	9 35	13 35	16 75	22 00	26 00	32 75	35 50	47 00
Flange Ends	4 25	5 25	6 00	7 25	10 00	14 65	18 00	23 75	27 50	31 00	33 50	45 50
Bell Ends . . . . .	.....	.....	.....	.....	9 50	.....	17 25	.....	27 50	.....	32 50	43 25

CHAPMAN IRON BODY WATER GATES.**COMPOSITION MOUNTINGS.****BOLTED TOPS.****BELL OR SPIGOT ENDS.****BELL ENDS.****SIZES, 2 TO 48 INCHES, INCLUSIVE.****SPIGOT ENDS.****Plate 265.**

Diameter of Opening, Inches.	End to End of Pipe when laid in Bell, Inches.	Diameter of Bell Socket, Inches.	Finished Weight Bell Ends, Pounds.	Finished Weight Spigot Ends, Pounds.	Bell or Spigot End, Each.
2	3 $\frac{1}{8}$	3 $\frac{1}{8}$	32	32	\$10 00
3	3 $\frac{3}{4}$	4 $\frac{1}{8}$	55	67	15 00
4	5 $\frac{1}{4}$	5 $\frac{1}{4}$	116	108	19 00
5	5 $\frac{1}{4}$	6 $\frac{1}{8}$	135	127	25 00
6	6	7 $\frac{1}{8}$	195	185	30 50
7	6	8 $\frac{1}{8}$	245	240	36 00
8	6 $\frac{3}{8}$	10	290	296	45 00
9	6 $\frac{7}{8}$	11	.....	.....	.....
10	7 $\frac{5}{8}$	12	439	470	62 00
12	8	14 $\frac{3}{8}$	600	701	82 00
14	10	16 $\frac{1}{4}$	843	946	.....
15	10	17 $\frac{1}{2}$	950	1022	.....
16	9 $\frac{7}{8}$	18 $\frac{1}{2}$	1080	1229	.....
18	10 $\frac{7}{8}$	20 $\frac{5}{8}$	1475	.....	.....
20	11 $\frac{1}{4}$	22 $\frac{3}{4}$	1700	.....	.....
22	11 $\frac{1}{2}$	24 $\frac{3}{4}$	.....	.....	.....
24	12 $\frac{1}{8}$	26 $\frac{3}{4}$	2750	.....	.....

**Plate 266.**

Notice Weights and Dimensions of our Valves.

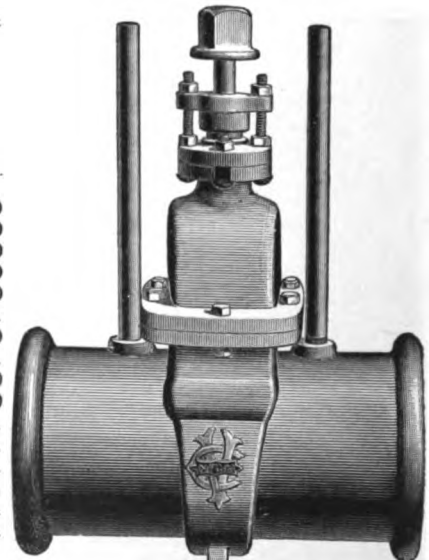
These Gates are made with Cast Iron Bodies, Caps and Nuts, Composition Spindles, Stuffing Boxes, Glands and Followers, Plugs, Cast Iron, with Composition Faces and Spindle Bushings; Water Metal Seats.

These Gates are more especially for use in Street Mains; they are extra heavy to resist the water hammer and general hard usage to which they are liable. The faces of the plug and seats never corrode, and the Gate will, at all times, open easily and close tightly. The flanges have no gaskets; bolts are extra heavy, and the spindle large in diameter, of solid composition. Gates can be furnished with either Bevel or Upright Gearing, or with Automatic Drips.

CHAPMAN IRON BODY GAS GATES.**BOLTED TOP.****BELL OR SPIGOT ENDS.****REGULAR BELL ENDS.****SIZES, 2 TO 48 INCHES, INCLUSIVE.****LONG END GAS GATES.****Plate 267.**

Diam. of Opening, Inches.	End to End of Pipe when laid in Bell, Inches.	Diameter of Bell Socket, Inches.	Finished Weight Bell Ends, Pounds.	Finished Weight Spigot Ends, Pounds.	Bell or Spigot End, Each.
2	3 $\frac{3}{8}$	3 $\frac{1}{8}$	30	30	\$ 8 00
3	3 $\frac{7}{8}$	4 $\frac{3}{4}$	55	67	10 00
4	4 $\frac{3}{4}$	5 $\frac{3}{4}$	87	82	14 50
5	5	7	120	120	20 00
6	5 $\frac{1}{2}$	8	154	148	24 00
7	6	8 $\frac{7}{8}$	.....	.....	.....
8	6 $\frac{1}{2}$	10	223	226	34 00
9	6 $\frac{7}{8}$	11	.....	.....	.....
10	7	12 $\frac{1}{8}$	369	378	47 00
12	7 $\frac{3}{8}$	14 $\frac{1}{2}$	513	567	62 00
14	8 $\frac{1}{4}$	16 $\frac{3}{4}$	675	750	.....
15	10	17 $\frac{1}{2}$	.....	.....	.....
16	8 $\frac{5}{8}$	18 $\frac{3}{4}$	800	890	.....
18	9 $\frac{1}{8}$	20 $\frac{7}{8}$	1075	.....	.....
20	10 $\frac{1}{8}$	23	1260	.....	.....
24	11 $\frac{3}{8}$	27	2147	.....	.....

Notice Weight and Dimensions of our Valves.

**Plate 268.**

These Valves are made with Cast Iron Bodies, Caps, Plugs and Nuts, and Wrought Iron Spindle (tinned) and Gas Metal Seats. They are especially designed for use on Street Mains, and have never failed to give satisfaction. The Gas Metal Seats resist all corrosive influences of the gas, and the seats and faces of the plug never corrode together, but are always clean, open easily and close tightly. They are furnished with Bolt Gland Stuffing Boxes; have no gaskets or packing in the Flange Joints.

THE LUNKEN GATE VALVES.

WITH BALANCED DISC AND RENEWABLE SEAT.

IRON BODY, SREWED.



Plate 269.

Made with Screwed Ends only.
 $\frac{1}{4}$ inch to 3 inch.
 For 150 lbs. Working Pressure.

BRASS BODY, SREWED.



Plate 270.

Made with Screwed and Flanged Ends.
 $\frac{1}{4}$ inch to 6 inch.
 For 200 lbs. Working Pressure.

- A Valve whose Seat and Disc are renewable without disconnecting from pipes.
- A Valve with balanced Disc; frictionless and operating easily under high pressure.
- A Valve, although with straight way, is more compact than a Globe Valve.
- A Valve provided with a rising spindle, thus indicating whether it is open or shut.
- A Valve such as all users have thought a necessity.

IRON BODY, SREWED—PLATE 269.

Warranted for 150 lbs. Working Pressure. Screwed Ends.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1 in.
Iron Body, Brass Mt'd, Screw Ends, each	\$1 20	1 25	1 50	1 90	2 50
Extra Seats, Discs and Wrenches, each	08	10	12	16	22
Distance End to End, Screw Ends	$1\frac{1}{2}$	$1\frac{5}{8}$	2	$2\frac{1}{4}$	$2\frac{3}{8}$ in.
Size	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Iron Body, Brass Mt'd, Screw Ends, each	\$3 50	5 00	7 50	12 00	15 00
Extra Seats, Discs and Wrenches, each	30	40	50	75	1 00
Distance End to End, Screw Ends	$2\frac{1}{8}$	$2\frac{1}{4}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$4\frac{1}{8}$ in.

NOTICE.—In ordering these Valves always mention: Iron.

These Valves have brass wearing parts (*i. e.*) Stem, Disc, Seat, Wedge and Stuffing-box, are intended to take the place of ordinary Globe and other style Gate Valves; are warranted to stand 150 lbs. working pressure, and made only with screw ends.

BRASS BODY, SREWED—PLATE 270.

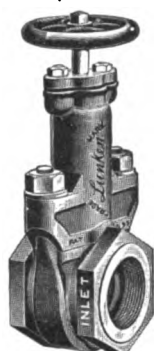
Warranted for 200 lbs. Working Pressure. Screw and Flange Ends.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Brass, Screw Ends, each	\$1 20	1 25	1 50	1 90	2 50	3 50	5 00
Brass, Flange Ends, each . . . . .	.....	.....	3 00	3 80	5 50	7 00	9 50
Extra Seats, Discs and Wrenches, each	08	10	12	16	22	30	40
Distance End to End, Screw Ends	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{1}{4}$ in.
Weight Complete	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$2\frac{1}{4}$	$3\frac{1}{8}$	$4\frac{1}{4}$ lbs.
Diameter of Flanges . . . . .	.....	.....	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5 in.
Distance Face to Face, Flange Ends . . . . .	.....	.....	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	3	$3\frac{1}{8}$ in.
Weight Complete . . . . .	.....	.....	$2\frac{1}{2}$	$3\frac{3}{8}$	5	$6\frac{3}{4}$	$9\frac{1}{2}$ lbs.
Size	2	$2\frac{1}{2}$	3	4	5	6 in.	
Brass, Screw Ends, each	\$7 50	14 00	20 00	80 00	110 00	150 00	
Brass, Flange Ends, each	15 00	24 00	32 00	90 00	130 00	175 00	
Extra Seats, Discs and Wrenches, each	50	75	1 00	.....	.....	.....
Distance End to End, Screw Ends	3	$3\frac{3}{4}$	4	$5\frac{1}{4}$	6	$6\frac{1}{2}$ in.	
Weight Complete	$6\frac{3}{4}$	11	17	55	85	115 lbs.	
Diameter of Flanges	6	7	$7\frac{1}{2}$	9	10	11 in.	
Distance Face to Face, Flange Ends	$3\frac{1}{4}$	4	$4\frac{1}{8}$	$5\frac{1}{2}$	6	7 in.	
Weight Complete	$12\frac{1}{2}$	$21\frac{1}{2}$	29	65	100	135 lbs.	

NOTICE.—In ordering these Valves always mention: Brass.

THE LUNKEN GATE VALVES.

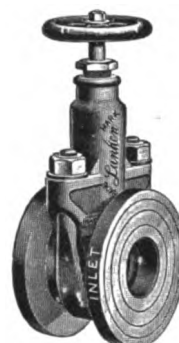
IRON BODY, SCREWED.



2 inch to 12 inch.
Heavy.
For 200 lbs.
Working Pressure.

Plate 271.

IRON BODY, FLANGED.



2 inch to 12 inch.
Heavy.
For 200 lbs.
Working Pressure.

Plate 272.

IRON BODY, BRASS MOUNTED.

Heavy. Warranted for 200 lbs. Working Pressure. Screw and Flange Ends.

Size	2	2½	3	3½	4	4½	5 in.
Iron, Brass Mounted, Screw Ends, each	\$ 9 00	12 00	15 00	18 00	22 00	26 00	32 00
Iron, Brass Mounted, Flange Ends, each	10 50	14 00	17 50	21 00	25 00	30 00	36 00
Extra Seats, Discs and Wrenches, each	50	75	1 00	1 25	1 50	2 00	2 50
Distance End to End, Screw Ends	3¾	4¾	4¾	5¾	5¾	6	6¾ in.
Distance Face to Face, Flange Ends	4	4¾	5	6	6¾	6¾	7 in.
Diameter of Flanges	6	7	7½	8½	9	9¼	10 in.
Weight Complete, Screw Ends	12	23	32	44	59	74	92 lbs.
Weight Complete, Flange Ends	18	31	42	56	73	89	111 lbs.
Size	6	7	8	9	10	12 in.	.....
Iron, Brass Mounted, Screw Ends, each	\$40 00	56 00	70 00	82 00	100 00	140 00	.....
Iron, Brass Mounted, Flange Ends, each	44 00	61 00	75 00	87 00	106 00	146 00	.....
Extra Seats, Discs and Wrenches, each	3 00	3 50	4 20	5 00	6 00	8 00	.....
Distance End to End, Screw Ends	7	7¼	7¾	7½	8½	9 in.	.....
Distance Face to Face, Flange Ends	8½	8¾	9	8¾	9¾	10½ in.	.....
Diameter of Flanges	11	12½	13½	15	16	19 in.	.....
Weight Complete, Screw Ends	124	157	200	225	265	395 lbs.	.....
Weight Complete, Flange Ends	150	187	233	269	318	454 lbs.	.....

Notice—When ordering these valves in 2 to 3 inch sizes, mention: Heavy—to distinguish from same sizes of Plate 270.

Iron Body, Brass Mounted Valves have solid brass stems, but Figures 271 and 272 can also be furnished with steel stems, without extra charge.

All orders will be filled with brass stem valves unless otherwise ordered.

Special prices will be furnished where specifications call for flanges other than above.

All "Lunken" Valves furnished with Standard English Threads or Flanges without extra cost.

ALL IRON.

Heavy. Warranted for 200 lbs. Working Pressure. Screw and Flange Ends.

Size	2	2½	3	3½	4	4½	5 in.
All Iron, Screw Ends, each	\$ 9 00	12 00	15 00	18 00	22 00	26 00	32 00
All Iron, Flange Ends, each	10 50	14 00	17 50	21 00	25 00	30 00	36 00
Extra Seats, Discs and Wrenches, each	50	75	1 00	1 25	1 50	2 00	2 50
Distance End to End, Screw Ends	3¾	4¾	4¾	5¾	5¾	6	6¾ in.
Distance Face to Face, Flange Ends	4	4¾	5	6	6¾	6¾	7 in.
Diameter of Flanges	6	7	7½	8½	9	9¼	10 in.
Weight Complete, Screw Ends	12	23	32	44	59	74	92 lbs.
Weight Complete, Flange Ends	18	31	42	56	73	89	111 lbs.
Size	6	7	8	9	10	12 in.	.....
All Iron, Screw Ends, each	\$40 00	56 00	70 00	82 00	100 00	140 00	.....
All Iron, Flange Ends, each	44 00	61 00	75 00	87 00	106 00	146 00	.....
Extra Seats, Discs and Wrenches, each	3 00	3 50	4 20	5 00	6 00	8 00	.....
Distance End to End, Screw Ends	7	7¼	7¾	7½	8½	9 in.	.....
Distance Face to Face, Flange Ends	8½	8¾	9	8¾	9¾	10½ in.	.....
Diameter of Flanges	11	12½	13½	15	16	19 in.	.....
Weight Complete, Screw Ends	124	157	200	225	265	395 lbs.	.....
Weight Complete, Flange Ends	150	187	233	269	318	454 lbs.	.....

LUDLOW'S DOUBLE GATE BRASS VALVES.

GLAND IN PACKING BOX.

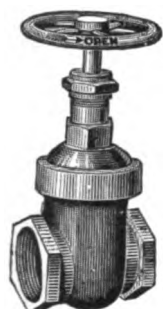


Plate 273.
1½ inch to 2½ inch.

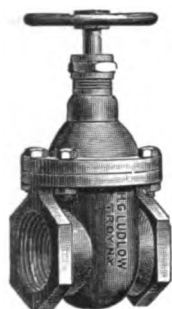


Plate 274.
2½ inches and upward.

DOUBLE GATE BRASS VALVES—GLAND IN PACKING BOX.

List No. 7.

Size.	Screw Socket.	Flange.	Diameter Standard Flange.	Face to Face of Screw Socket.	Face to Face of Flanges.	Extra for Slide Stem and Lever, Subject to Discount.
½	\$ 1 40	.....	.....	2¼	.....	\$0 80
¾	1 80	.....	.....	2½	.....	80
1	2 35	.....	4	2⅞	3	80
1¼	3 40	\$ 5 70	4⅜	3⅜	3⅜	1 00
1½	4 40	7 40	5	3¾	3⅞	1 00
1¾	.....	.....	5¾	.....	4⅞	1 00
2	6 25	11 00	6	4⅞	4⅞	1 25
2½	13 75	18 75	6½	4⅞	5⅞	1 75
3	15 50	21 50	7	5	6¼	2 00
3½	23 50	30 50	7½	5⅞	6⅞	2 00
4	34 00	43 00	9	6¼	7¼	2 00
4½	45 00	55 00	9½	7	7¾	2 25
5	52 00	64 00	10	7¼	8⅞	2 25
6	76 00	88 00	11	7½	9	2 25

Avoid daubing the faces with lead.

QUICK MOVING SLIDE STEM AND LEVER VALVE.

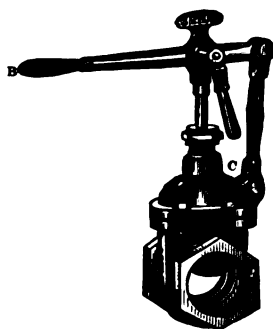
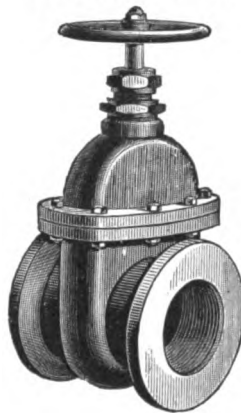
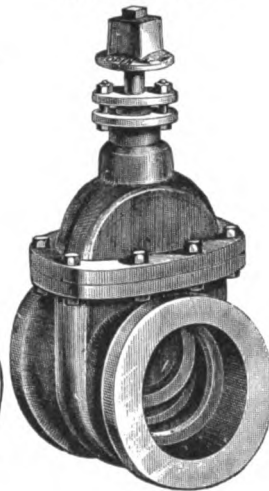
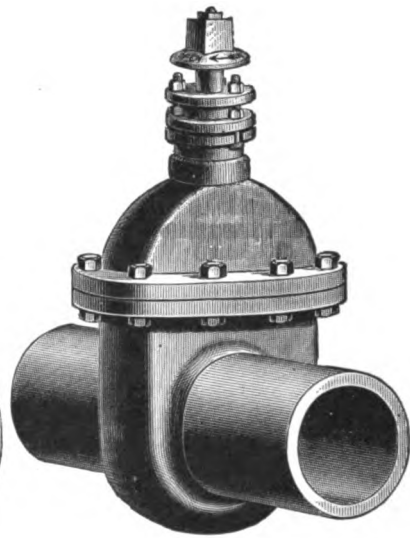


Plate 275.

Plate 275 shows our Quick Moving Slide Stem and Lever Valve, with a simple arrangement by which the gate is held firmly at any desired point in opening and closing. The small lever, C, acts as a nut on the bolt passing through the jaws which form the top of the plain valve stem. The lever, B, moves the gate as required, when a slight movement of the small lever, C, compresses the jaws, thus fastening the large lever securely. On small brass valves a wheel takes the place of the lever, C.

LUDLOW GATE VALVES.**SPIGOT VALVE.****HUB VALVE.****FLANGE VALVE.****SCREWED VALVE.****Plate 276.****Plate 277.****Plate 278.****Plate 279.****IRON VALVES—SINGLE GATE.**

List No. 1.

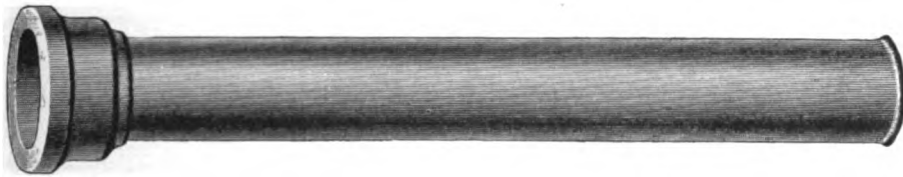
LIST PRICES ALL IRON.					LIST PRICES BRASS MOUNTED.							MEASUREMENTS BRASS MOUNTING OR ALL IRON.				
Size Inches.	Screw Socket	Flange	Hub	Spigot	Screw Socket.	Flange	Hub.	Spigot.	Extra for Slide Stem and Lever.	Extra for Outside Screw and Yoke.	Diameter Standard Flange.	Face to Face of Flanges.	Face to Face of Screw Socket.	End to End of Hubs.	Depth of Hub.	
1 ½	\$ 5 00	\$ 5 75	.....	.....	\$ 5 00	\$ 5 75	.....	.....	\$ 1 00	.....	Inches	Inches	Inches	Inches	Inch
2	6 00	6 75	\$ 6 00	\$ 6 25	6 00	6 75	\$ 6 50	\$ 6 75	1 25	.....	5 ½	5 ½	4	.....	.....
2 ½	8 25	9 00	8 25	8 50	8 75	9 50	9 00	9 25	1 75	.....	6 ½	5 ¾	4 ¾	7	2 ¼
3	9 50	10 50	9 50	10 00	11 00	12 00	11 00	11 50	2 00	\$ 8 50	7	6 ¾	5 ¾	7 ¾	2 ¼	
3 ½	13 25	14 50	13 00	13 50	15 00	15 75	14 50	15 00	2 00	9 25	8	6 ¾	5 ½	8 ¾	2 ½	
4	13 50	15 00	13 50	14 00	16 25	17 25	16 00	16 50	2 00	10 00	8 ½	8 ¾	7	9 ¾	2 ¾	
5	21 50	22 00	20 50	21 00	23 75	24 00	22 75	23 25	2 25	12 00	9	8 ¾	7 ¼	9 ¾	2 ¾	
6	25 50	26 00	24 00	24 75	28 00	28 50	26 00	26 75	2 25	14 00	10 ¾	10 ¾	11	12	3 ½	
7	31 00	31 50	30 00	31 00	35 25	35 75	34 00	35 00	2 25	16 00	11	11 ¾	11 ¼	12 ½	3 ¾	
8	34 00	33 50	32 00	33 25	40 00	40 00	38 50	39 75	2 25	18 00	12	11 ¼	11 ¾	13 ¾	4	
10	53 00	52 00	48 00	50 50	58 00	58 50	54 00	56 50	3 25	23 00	13	11	12 ¾	14 ¾	4	
12	64 50	63 00	63 00	66 50	74 00	73 00	67 00	70 50	4 00	27 50	16	12 ¾	12 ¾	14 ¾	4	
											18	12 ¾	13 ¼	14 ¾	4	

IRON VALVES—DOUBLE GATE.

TO BEAR HEAVY PRESSURE EITHER SIDE OF GATE.

List No. 4.

LIST PRICES ALL IRON					LIST PRICES BRASS MOUNTED.					MEASUREMENTS BRASS MOUNTING OR ALL IRON.					
Size, Inches.	Screw Socket.	Flange.	Hub.	Spigot	Screw Socket.	Flange.	Hub.	Spigot.	Extra for Slide Stem and Lever, Subject to Discount.	Extra for Outside Screw and Yoke.	Diameter Standard Flange.	Face to Face of Flanges.	Face to Face of Screw Socket.	End to End of Hub.	Depth of Hub.
1	\$ 4 75				\$ 5 00						Inches	Inches	Inches	Inches	Inch
1¼	5 25				5 50								3¾		
1½	5 75	\$ 6 25			6 00	\$ 6 25			\$ 1 00		5½	5½	3¾		
2	6 25	7 25	\$ 7 00	\$ 7 25	7 00	7 50	\$ 7 00	\$ 7 25	1 25		6½	5¾	4	7	2¼
2½	8 75	9 25	8 50	8 75	10 25	10 75	10 00	10 25	1 75		7	6¾	5¾	7¾	2¼
3	10 00	11 25	10 25	10 75	12 25	13 25	14 50	15 00	2 00	\$ 8 50	8	6¾	5½	8¾	2½
3½	14 00	15 25	13 75	14 25	16 50	17 50	16 00	16 50	2 00	9 25	8½	8¼	7	9¾	2½
4	15 00	16 50	15 00	15 50	18 00	18 50	17 00	17 50	2 00	10 00	9	8¼	7¼	9¾	2¾
4½	20 50	21 50	20 50	21 00	23 00	23 50	22 00	22 50	2 25	11 00	9½	9¾	9½		
5	23 00	23 50	22 00	22 50	25 00	25 50	24 00	24 50	2 25	12 00	10	10¾	11	12	3½
6	27 00	28 00	26 00	26 75	30 50	31 00	28 00	28 75	2 25	14 00	11	11¾	11¼	12½	3¾
7	33 00	33 50	32 00	33 00	38 00	38 00	37 00	38 00	2 25	16 00	12	11¼	12	13¾	
8	36 50	36 50	35 00	36 25	45 00	43 50	42 00	43 25	2 25	18 00	13	11	12¾	14¾	4
10	54 00	53 00	51 00	53 50	64 00	64 50	60 00	62 50	3 25	23 00	16	13¾	13¾	14½	4
12	66 50	65 00	62 00	65 50	82 50	80 00	76 00	79 50	4 00	27 50	18	14¾	13¾	15	4

CAST IRON PIPE.**FOR WATER AND GAS.****Plate 280.****TABLE OF WEIGHT OF CAST IRON PIPES.**

Size Internal Diameter	Total Length	Depth of Socket	Average Weight per Foot	
			Heavy	Light
3 inch	12 feet, 6 inch	4 inch	15 lbs.	13 lbs.
4 inch	12 feet, 4 inch	4 inch	24 lbs.	18 lbs.
6 inch	12 feet, 4 inch	4 inch	35 lbs.	30 lbs.
8 inch	12 feet, 4 inch	4 inch	50 lbs.	40 lbs.
10 inch	12 feet, 4 inch	4 inch	70 lbs.	55 lbs.
12 inch	12 feet, 4 inch	4½ inch	85 lbs.	70 lbs.
14 inch	12 feet, 4 inch	4½ inch	115 lbs.	95 lbs.
15 inch	12 feet, 4 inch	4½ inch	120 lbs.	110 lbs.
16 inch	12 feet, 4 inch	4½ inch	130 lbs.	105 lbs.
18 inch	12 feet, 5½ inch	4½ inch	150 lbs.	140 lbs.
20 inch	12 feet, 5½ inch	5 inch	180 lbs.	150 lbs.
24 inch	12 feet, 5½ inch	5 inch	240 lbs.	180 lbs.
30 inch	12 feet, 5½ inch	5½ inch	340 lbs.	255 lbs.
36 inch	12 feet, 5½ inch	5½ inch	500 lbs.	350 lbs.
48 inch	12 feet, 5½ inch	5½ inch	850 lbs.	600 lbs.

We make Pipes five per cent heavier or lighter, or any intermediate weight desired.

A variation of five per cent is usually allowed from the mean weight ordered.

All are cast vertically; coated inside and out with coal tar varnish, and tested to 300 lbs. hydrostatic pressure per square inch for water, and to 250 lbs. for gas.

TABLE OF LEAD AND YARN REQUIRED TO CAULK THE JOINTS OF DIFFERENT SIZE CAST IRON PIPE

Size	3	4	6	8	10	12	14	15 in.
Lead per Joint	3½	4½	8	11	15	20	24	36 lbs.
Hemp per Joint	6	7	9	11	13	18	22	25 ozs.

Prices on application.

SPECIAL FITTINGS FOR CAST IRON WATER AND GAS PIPE.

QUARTER BEND.

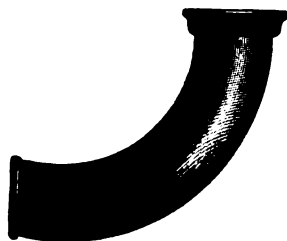


Plate 281.

ONE-EIGHTH BEND.



Plate 282.

APPROXIMATE WEIGHT.

Size	3	4	6	8	10	12	16	20 in.
Plate 281, for Water	50	80	138	201	300	440	730	1,425 lbs.
Plate 281, for Gas	33	70	117	190	220	310	.....	.....
Plate 282, for Water	40	70	102	205	260	450	550	1,200 lbs.
Plate 282, for Gas	35	60	94	144	230	295	.....	.....

TEE.

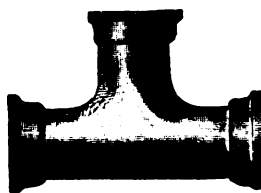


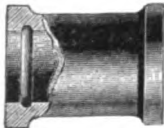
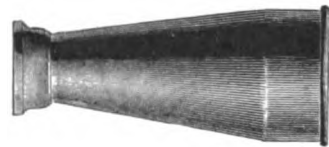
Plate 283.

Size Inches	Pounds Water	Pounds Gas	Size Inches	Pounds Water	Pounds Gas	Size Inches	Pounds Water	Pounds Gas
3 x 3 x 3	60	50	8 x 8 x 6	250	200	12 x 12 x 12	540	.....
4 x 4 x 4	115	85	8 x 8 x 4	235	185	12 x 12 x 10	505	.....
4 x 4 x 3	85	80	8 x 8 x 3	190	160	12 x 12 x 8	460	.....
6 x 6 x 6	190	150	10 x 10 x 10	430	.....	11 x 12 x 6	440	.....
6 x 6 x 4	155	110	10 x 10 x 8	350	.....	12 x 12 x 4	420	.....
6 x 6 x 3	140	95	10 x 10 x 6	320	.....	.....	.....	.....
8 x 8 x 8	260	210	10 x 10 x 4	297	.....	.....	.....	.....

Prices on application.

SPECIAL FITTINGS FOR CAST IRON WATER AND GAS PIPE.**APPROXIMATE WEIGHT.****CROSS.****Plate 284.**

Size, Inches	Pounds, Water	Pounds, Gas	Size, Inches	Pounds, Water	Pounds, Gas	Size, Inches	Pounds, Water	Pounds, Gas
3 x 3 x 3 x 3 . .	75	60	8 x 8 x 6 x 6 . .	285	265	10 x 10 x 3 x 3 .	333	.....
4 x 4 x 4 x 4 . .	120	105	8 x 8 x 4 x 4 . .	255	230	12 x 12 x 12 x 12	713	.....
4 x 4 x 3 x 3 . .	109	90	8 x 8 x 3 x 3 . .	205	.....	12 x 12 x 10 x 10	645	.....
6 x 6 x 6 x 6 . .	225	175	10 x 10 x 10 x 10	565	.....	12 x 12 x 8 x 8 .	560	.....
6 x 6 x 4 x 4 . .	200	160	10 x 10 x 8 x 8 .	425	.....	12 x 12 x 6 x 6 .	495	.....
6 x 6 x 3 x 3 . .	175	150	10 x 10 x 6 x 6 .	385	.....	12 x 12 x 4 x 4 .	480	.....
8 x 8 x 8 x 8 . .	325	300	10 x 10 x 4 x 4 .	350	.....		

SLEEVE.**Plate 285.****PLUG.****Plate 286.****REDUCER.****Plate 287.**

Size	3	4	6	8	10	12	16	20 in.
Plate 285, for Water	24	40	70	120	150	200	300	450 lbs.
Plate 285, for Gas	20	25	55	75	113	145 lbs.	.....	.....
Plate 286, for Water	8	12	20	40	60	90	180	210 lbs.
Plate 286, for Gas	6	9	18	28	40	70 lbs.	.....	.....

REDUCER—PLATE 287.

Size, Inches	Pounds, Water	Pounds, Gas	Size, Inches	Pounds, Water	Pounds, Gas
4 to 3	50	35	10 to 8	201	.....
6 to 4	109	95	10 to 6	170	.....
6 to 3	104	80	10 to 4	155	.....
8 to 6	153	130	12 to 10	300	.....
8 to 4	138	100	12 to 8	250	.....
8 to 3	120	90	12 to 6	225	.....

Prices on application.

CORPORATION STOPS.

FOR MUELLER'S TAPPING MACHINE, WITH EITHER STRAIGHT OR BENT COUPLINGS.

FITTED FOR SREW OR HEXAGON PLUG.

No. 1.
With Bent Couplings.
Fitted for Hexagon Plug.



Plate 288.

No. 2.
With Straight Coupling.
Fitted for Hexagon Plug.

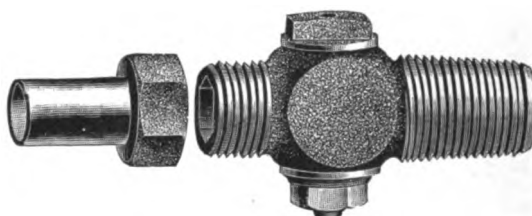


Plate 289.

No. 3.
Threaded for Iron Pipe.
Fitted for Hexagon Plug.

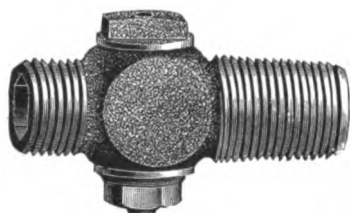


Plate 290.

No. 4.
With Bent Coupling
Fitted for Screw Plug

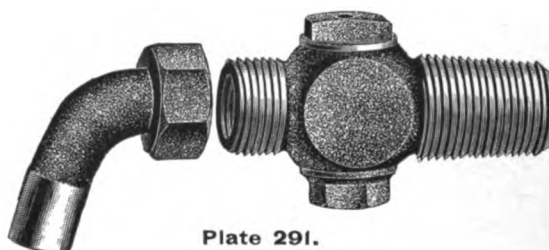


Plate 291.

No. 5.
With Straight Coupling.
Fitted for Screw Plug.



Plate 292.

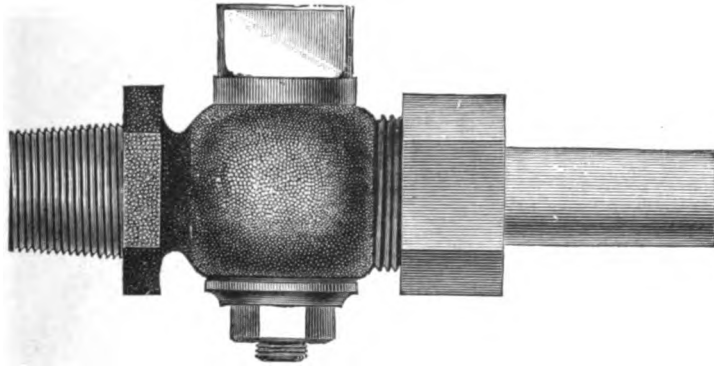
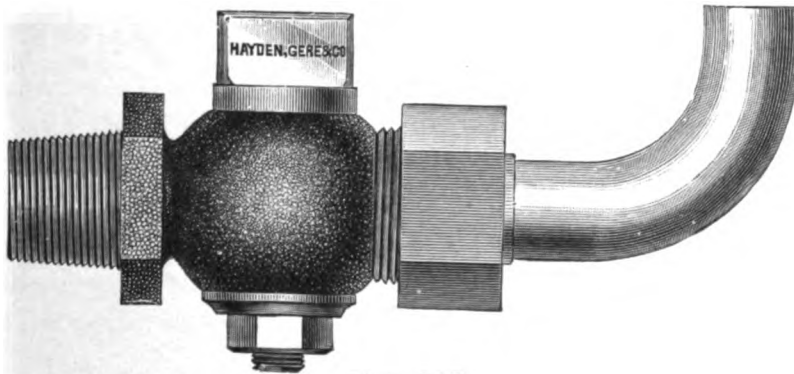
No. 6.
Threaded for Iron Pipe.
Fitted for Screw Plug.



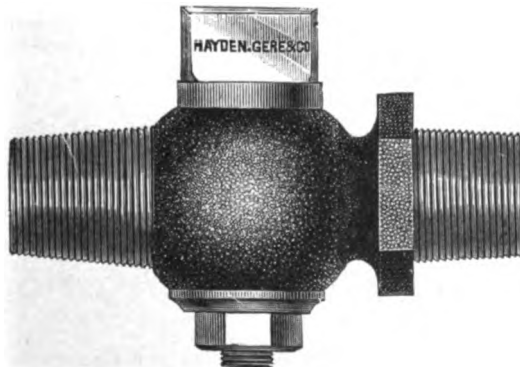
Plate 293.

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 in.
Price, Nos. 1, 2, 4 and 5, each	\$1 20	1 35	1 70	2 50	3 85
Price, Nos. 3 and 6, each . . . . .	.....	1 10	1 40	2 10	3 35

Corporation Stops for all other styles of machines furnished on application.

CORPORATION STOPS.**MALE THREAD FOR IRON PIPE.****STRAIGHT COUPLING.****No. 7.****Plate 294.****BENT COUPLING.****No. 8.****Plate 295.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
No. 7 or 8, per doz	\$16 00	19 00	23 00	34 00	53 00	104 00	136 00	210 00

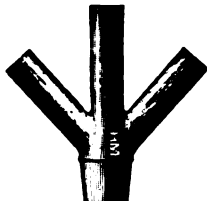
BOTH ENDS WITH MALE THREAD, FOR IRON PIPE.**No. 9.****Plate 296.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$ in.
Per doz	\$13 00	16 00	20 00	29 00	46 00	90 00

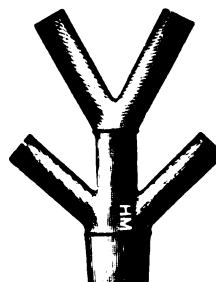
MUELLER'S BRASS WATER CONNECTIONS.



NO 1
Plate 297.



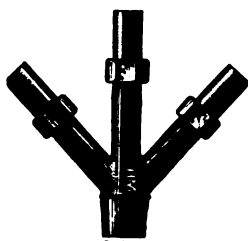
NO 2
Plate 298.



NO 3
Plate 299.



NO 4
Plate 300.



NO 5
Plate 301.



NO. 6.
Plate 302.

As with the Mueller Machine, no larger Tap than 1 inch can be made, and as we have been called upon to furnish Connections for Supplies larger than 1 inch, we have made up a line of patterns and are now prepared to supply at reasonable prices our Brass Water Connections for $1\frac{1}{4}$ inch, $1\frac{1}{2}$ inch and 2 inch Supply Pipes.

The Branch Openings or Inlets of these Connections are all for One Inch Mueller Corp. Stop Cocks, and the outlets for Supply Pipes are:

On the 2 Branch for $1\frac{1}{4}$ inch Pipe; on the 3 Branch for $1\frac{1}{2}$ inch Pipe; on the 4 Branch for 2 inch Pipe.

You will observe that our Connections are so constructed that the flow of water through the different Branches does not obstruct each other.

The Connection should be set about 18 inches from the Main, and the distance between each Tap in Main should be about 12 inches.

No. 1 Brass Water Connection, price	\$1 50	No. 4 Brass Water Connection, price	\$3 00
No. 2 Brass Water Connection, price	2 00	No. 5 Brass Water Connection, price	4 50
No. 3 Brass Water Connection, price	3 00	No. 6 Brass Water Connection, price	6 00

Order by Number.

Should you wish any of the Brass Y's with a different Connection, state fully what you want, as we will make any style of Connection that our Customers wish. For example: You can have the No. 1 Brass Connection for Lead Pipe on the Branches, and then the Outlet for Iron Pipe Connection, etc. For the special Connections we will make an extra charge at just what it cost.

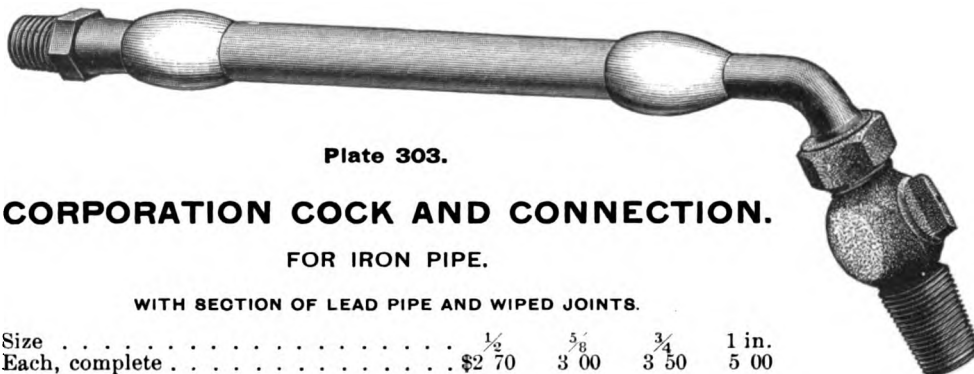


Plate 303.

CORPORATION COCK AND CONNECTION.

FOR IRON PIPE.

WITH SECTION OF LEAD PIPE AND WIPED JOINTS.

Size	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 in.
Each, complete	\$2 70	3 00	3 50	5 00

MUELLER'S IMPROVED WATER PIPE TAPPING MACHINE.**Plate 304.**

Taps high or low pressure mains. No escape of water while drilling and tapping. Our machine is undoubtedly the most complete Tapping Machine of the age. During all the many years of its existence, it has withstood the most severe tests, and is pronounced by skilled and experienced mechanics, as well as civil and hydraulic engineers, to be the most complete and successful Water Tapping Machine manufactured.

By the use of this machine a tap can be easily made by any person, and it does not necessarily require skilled labor. It makes it a pleasure rather than labor to make a tap, since the water does not have to be shut off on the mains, and the tapper need not fear of getting soaking wet, no matter what the pressure may be in the mains.

Water Tapping Machine, complete, includes: 1 each, combined Drill and Tap— $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 inch; 1 each, Screw or Hex. Plug— $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 inch; 4 Malleable Iron Saddles, any size; 1 Chain, for any size Pipe.

Price \$100 00

In case all the tools and saddles are not required, or more saddles are needed, deduct or add, whichever the case may be, according to price list of extras below.

Combined Drills and Taps, $\frac{3}{8}$ inch	\$3 75
Combined Drills and Taps, $\frac{1}{2}$ inch	4 00
Combined Drills and Taps, $\frac{5}{8}$ inch	4 50
Combined Drills and Taps, $\frac{3}{4}$ inch	5 50
Combined Drills and Taps, 1 inch	6 50
Screw Plugs, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and 1 inch, each	60
Hexagonal Plugs, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and 1 inch, each	60
Malleable Iron Saddles, 2, 3, 4, 6, 8, 10, 12, 14, 15, 16, 18, 20, 24, 30 and 36 inch, each	1 00
4 $\frac{1}{2}$ inch Rubber Gasket	25
7 $\frac{1}{2}$ inch Rubber Gasket	1 00
Power Clevis, extra	5 00

Power Clevis is never sent with a complete Tapping Machine unless specially ordered.

The Power Clevis is an extra attachment, and is needed only where very heavy pressure exists, say 90 pounds, or upward. With this extra attachment a tap can easily be made against any existing high pressure.

In ordering a machine it is necessary to state the sizes of tools required, whether Screw or Hexagon Plugs are wanted, and also sizes of water mains to be tapped. If style of Plug is not mentioned, Screw Plugs will be sent. If sizes of mains are not mentioned, saddles for 4, 6, 8 and 10 inch mains will be sent. Also state approximate amount of domestic pressure. Full instructions with every machine.

LENNOX IMPROVED TAPPING MACHINE.

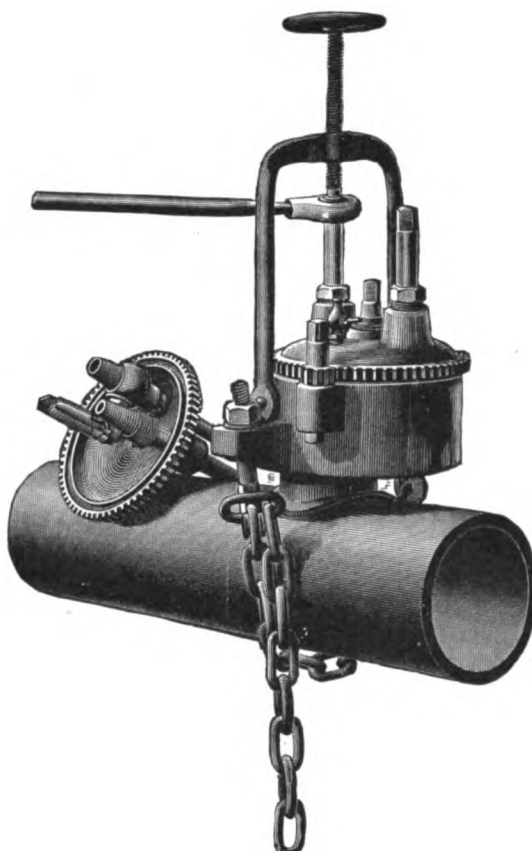


Plate 305.

Lennox Tapping Machine complete, includes :

1 each, Combined Drill and Tap	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 in.
1 each, Screw or Hex. Plug	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 in.
Six Malleable Iron Saddles, any size.				
One Chain for any size of pipe.				
Price	\$100 00			

EXTRAS.

1 inch Combined Drill and Tap	\$6 50
$\frac{3}{4}$ inch Combined Drill and Tap	5 50
$\frac{5}{8}$ inch Combined Drill and Tap	4 50
$\frac{1}{2}$ inch Combined Drill and Tap	4 00
$\frac{3}{8}$ inch Combined Drill and Tap (made to order)	3 75
Pure rubber Gaskets, each	50

In ordering a machine it is necessary to state the size of tools desired, also sizes of pipes to be tapped, and what kind or make of Corporation Cocks you intend to use. If sizes of pipes are not mentioned in the order, 4, 6, 8, 10, 12 and 14 inch Saddles will be sent.

THE RUMSEY DRY-PIPE TAPPING MACHINE.

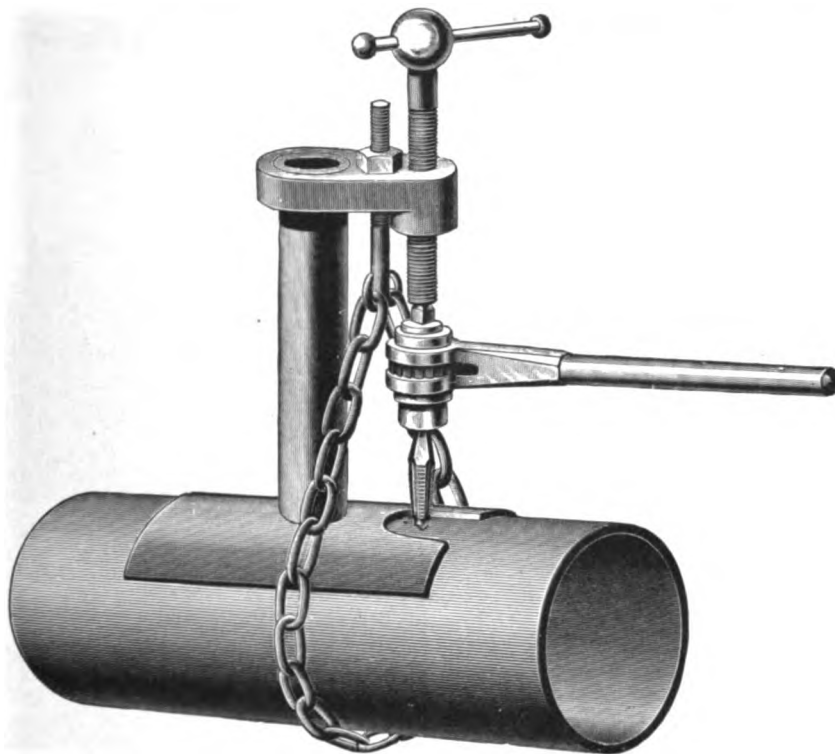


Plate 306.

Price, with Chain for Pipe, from 4 to 12 inches, without Ratchet \$10 00

CROW.

FOR DRILLING AND TAPPING STREET MAINS.

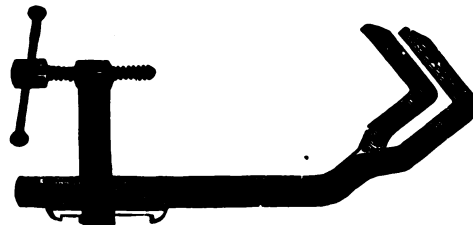


Plate 307.

No. 1, for drilling and tapping, from 1½ to 3 inches	. . . . .	\$10 00
No. 2, for drilling and tapping, from 1½ to 6 inches	. . . . .	13 00
No. 3, for drilling and tapping, from 1½ to 12 inches	. . . . .	16 00

WATKINS' PATENT PIPE JOINTER.

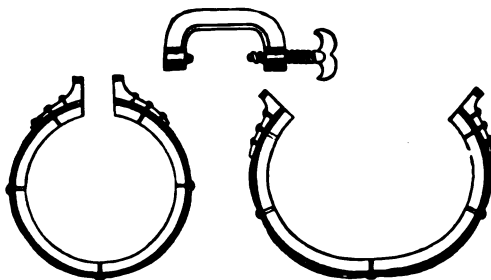
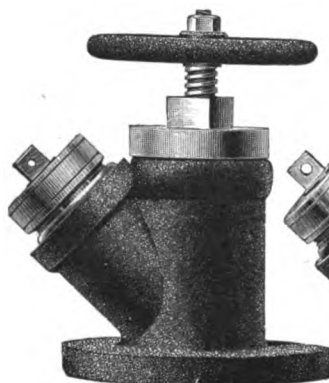
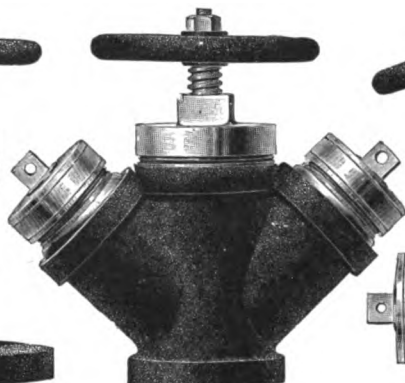
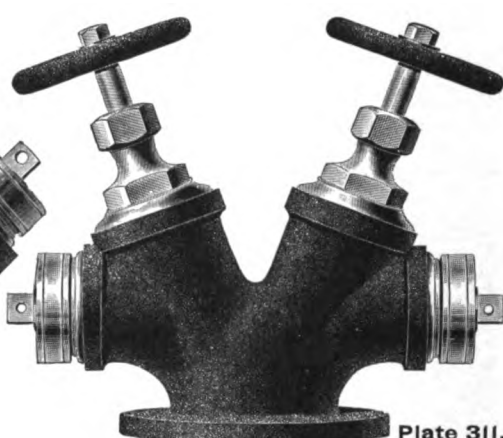


Plate 308.

This is an improvement in devices for filling Joints of metal Pipe when made with bell and spigot, and to be packed with lead or other soft metal.

The Watkins' Jointer is composed of pliable Steel Bands and Gum Gasket, so arranged as to be more readily and easily applied than clay. It is impossible for a joint to blow, and in laying large sizes, the services of two men are dispensed with. The jointer is durable; one 36 inch, after laying 1,000 joints of Pipe, was perfect, and as good as when first used.

Size .	2	3	4	6	8	10	12	16	20	24	30	36	48 in.
Each .	\$2 00	3 00	4 00	6 00	8 00	10 00	12 00	16 00	20 00	24 00	30 00	36 00	48 00

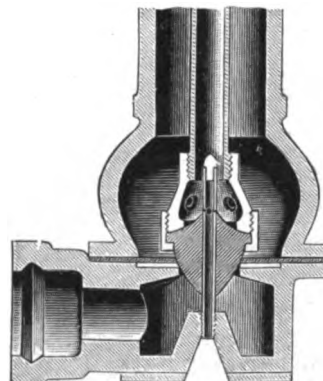
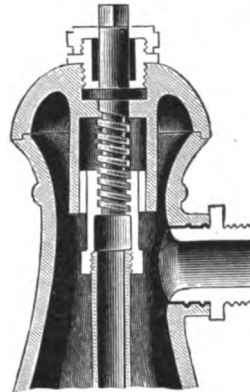
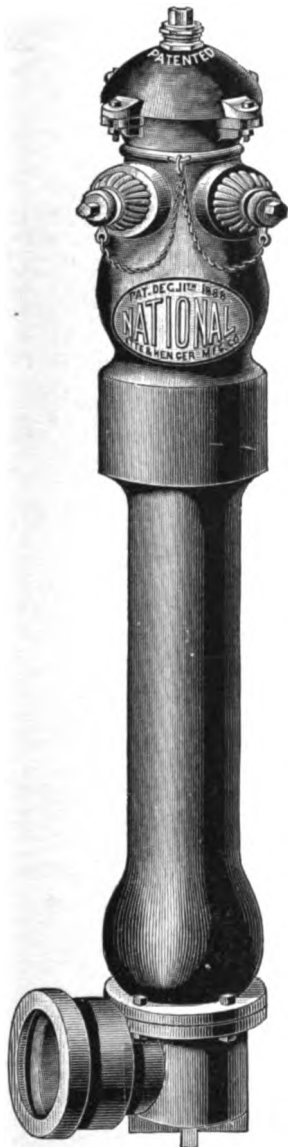
MILL HYDRANTS.**SINGLE DISCHARGE.****Plate 309.****DOUBLE DISCHARGE.****Plate 310.****DOUBLE VALVE.****Plate 311.**

	Inlet	Outlet	Each
Plate 309, Screwed or Flanged.	2½	2½	\$11 00
Plate 310, Screwed or Flanged.	2½	2½	12 00
Plate 311, Screwed or Flanged.	4½	2½	22 50

Diameter of Bottom Flanges, 8 inch.

POURING CLAMP.**Plate 312.**

For 2 inch O. D.	\$ 2 66
For 3 inch O. D.	3 00
For 4 inch O. D.	3 33
For 5 inch O. D.	3 66
For 6 inch O. D.	4 00
For 7 inch O. D.	4 33
For 8 inch O. D.	4 66
For 9 inch O. D.	5 00
For 10 inch O. D.	5 33
For 11 inch O. D.	5 66
For 12 inch O. D.	6 00
For 13 inch O. D.	6 33
For 14 inch O. D.	6 66
For 15 inch O. D.	6 66
For 16 inch O. D.	6 66
For 18 inch O. D.	9 37
For 20 inch O. D.	10 62
For 22 inch O. D.	11 87
For 24 inch O. D.	13 43

NATIONAL FIRE HYDRANT.**BRASS MOUNTED, RUBBER VALVE POSITIVE WASTE, GUARANTEED.****Plate 313.**

One Heavy Rubber Washer controls entire Valve and Waste. Full descriptive matter sent upon application.

Sizes and List Prices.

Diameter of Inlet Pipe.	Pave-ment to center of Inlet.	One 2½ in. Hose Nozzle.	Two 2½ in. Hose Nozzles.	Three 2½ in. Hose Nozzles.	One Steamer Nozzle.	One Steamer and one 2½ in. Nozzle.	One Steamer and two 2½ in. Nozzles.	Frost Case Standard Length.	Each ft. in length of Stand Pipe, add or deduct.	Each ft. in length of Frost Case add or deduct.
3 in.	5 ft.	\$27 50	\$29 50	\$31 50	\$29 00	\$31 50	\$33 50	\$3 00	\$1 20	\$0 50
4 in.	5 ft.	32 00	34 00	36 00	34 00	36 00	38 00	4 00	1 50	75
5 in.	5 ft.	38 00	40 00	42 00	40 00	42 00	44 00	5 00	1 75	1 00
6 in.	5 ft.	47 00	49 00	51 00	49 00	51 00	53 00	6 00	2 25	1 25

The above prices are based on standard length, viz., 5 feet from ground surface to bottom of connecting pipe.

CHAPMAN FIRE HYDRANT.

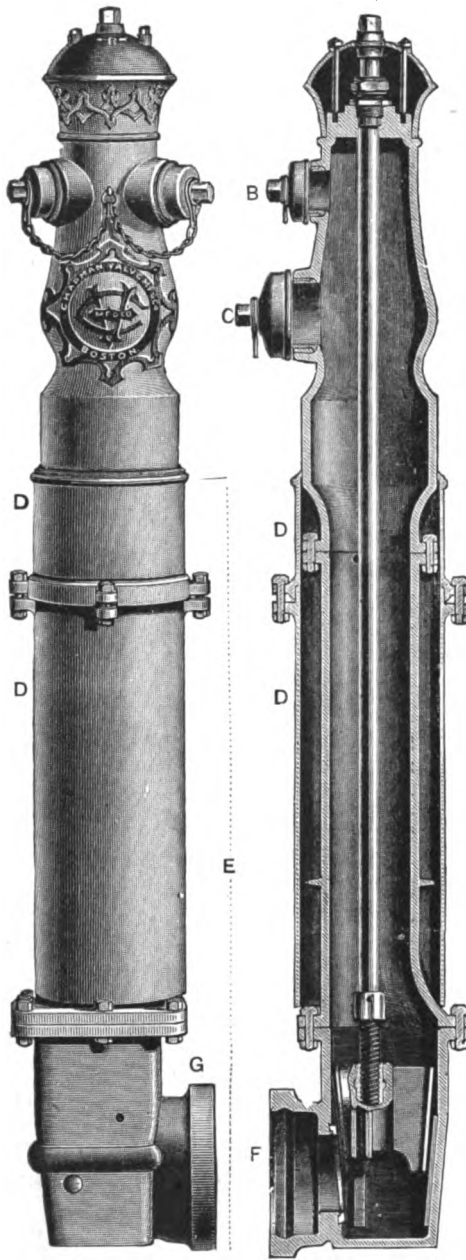


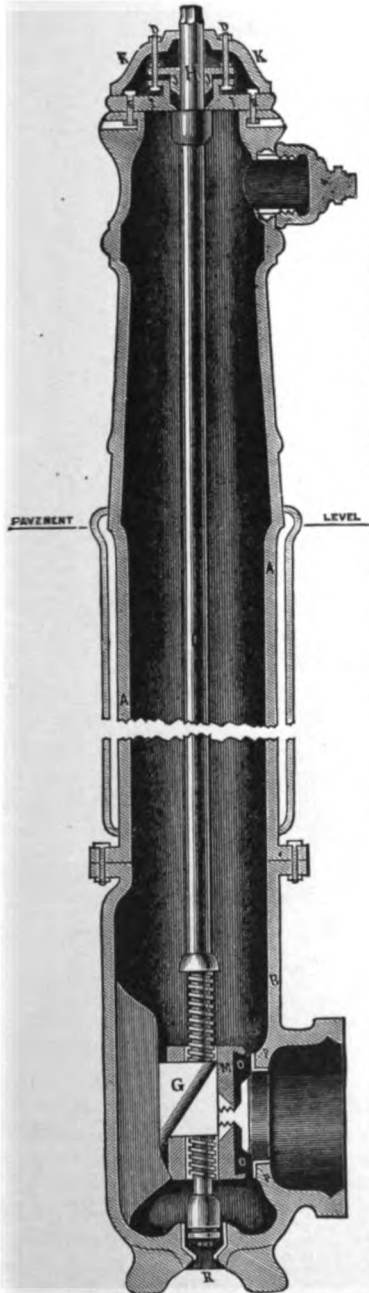
Plate 314.

IN ORDERING CHAPMAN FIRE HYDRANTS GIVE

Size and form of nut to open hydrant (A)?
 Number hose nozzles (B)?
 Number steamer nozzles (C)?
 With or without frost cases (DD)?
 Length from pavement to bottom (E)?
 Size of connection to main (F)?
 Bell, screw, flange or spigot connection (G)?
 Inside diameter to stand pipe, $3\frac{1}{4}$, $4\frac{1}{4}$, $5\frac{1}{4}$,
 or $6\frac{1}{4}$ inches (H)?

Post Hydrants. Metal Gate to bear heavy pressure. Composition Mounted. Water Babbitt Seats.

STANDARD DIMENSIONS.	Without Frost Case.		Frost Case Additional.		Each Hose Nozzle Additional.		Each Steamer Nozzle Additional.		Each foot in Length of Stand Pipe. Add or Deduct.		Each foot in Length of Frost Case. Add or Deduct.	
	Weight.	List.	Weight.	List.	Weight.	List.	Weight.	List.	Weight.	List.	Weight.	List.
3 INCH HYDRANT. Diameter of Stand Pipe, $3\frac{1}{4}$ inches. Length Pavement to Bottom, 5 feet. One $2\frac{1}{2}$ inch Hose Nozzle.	243 lbs.	\$25 00	68 lbs.	\$4 10	6 lbs.	\$1 45	17 lbs.	\$3 50	20 lbs.	\$0 90	12 lbs.	\$0 60
4 INCH HYDRANT. Diameter of Stand Pipe, $4\frac{1}{4}$ inches. Length Pavement to Bottom, 5 feet. Two $2\frac{1}{2}$ inch Hose Nozzles.	340 lbs.	31 85	81 lbs.	4 75	6 lbs.	1 45	17 lbs.	3 50	29 lbs.	1 35	20 lbs.	1 00
5 INCH HYDRANT. Diameter of Stand Pipe, $5\frac{1}{4}$ inches. Length Pavement to Bottom, 5 feet. Two $2\frac{1}{2}$ inch Hose and one Steamer Nozzle.	425 lbs.	41 00	88 lbs.	5 15	6 lbs.	1 45	17 lbs.	3 50	34 lbs.	1 65	22 lbs.	1 10
6 INCH HYDRANT. Diameter of Stand Pipe, $6\frac{1}{4}$ inches. Length Pavement to Bottom, 5 feet. Two $2\frac{1}{2}$ inch Hose and one Steamer Nozzle.	560 lbs.	51 35	114 lbs.	6 60	6 lbs.	1 45	17 lbs.	3 50	40 lbs.	1 90	28 lbs.	1 40

LUDLOW FIRE HYDRANT.**HYDRANT PRICE LIST.****RUBBER-FACED SLIDE GATE FIRE HYDRANT.****Plate 315.**

Diameter of Pipe Connection, inches.	2	3 or 4	3 or 4	6	4 or 6	4 or 6	6	8	8 or 10
Diameter of Stand Pipe, inches.	3	4 5/8	5 3/4	5 3/4	6 1/4	7	8	8	10
Diameter of Seat Ring, inches.	2	3	4	4	4 1/2	5	6	6	8
One 2-inch Nozzle.	17 00								
One 2 1/2 Nozzle.		28 00	31 00	31 50					
Two 2 1/2 Nozzles.			33 00	33 50	35 50	38 50	49 00	50 25	
Three 2 1/2 Nozzles.			35 00	35 50	37 50	40 50	51 00	52 25	
Four 2 1/2 Nozzles.						42 50	53 00	54 25	
Six 2 1/2 Nozzles.									130 00
One Steamer Nozzle.			33 00	33 50	35 50	38 50	49 00	50 25	
One Steamer and One 2 1/2 Nozzle.			35 00	35 50	37 50	40 50	51 00	52 25	
One Steamer and Two 2 1/2 Nozzles.			37 00	37 50	39 50	42 50	53 00	54 25	
Frost Case, Standard Length.		4 50	5 00	5 00	5 60	6 50	7 50	7 50	11 00
For each 6 inches more or less than Standard length of Stand Pipe, add to or deduct from List.	45	60	75	75	80	85	1 00	1 00	2 25
For each 6 inches more or less than Standard length of Frost Case, add to or deduct from List.		44	50	50	58	70	90	90	1 30
Independent Nozzle Gate, each.			3 50	3 50	3 50	3 75	3 75	3 75	4 50

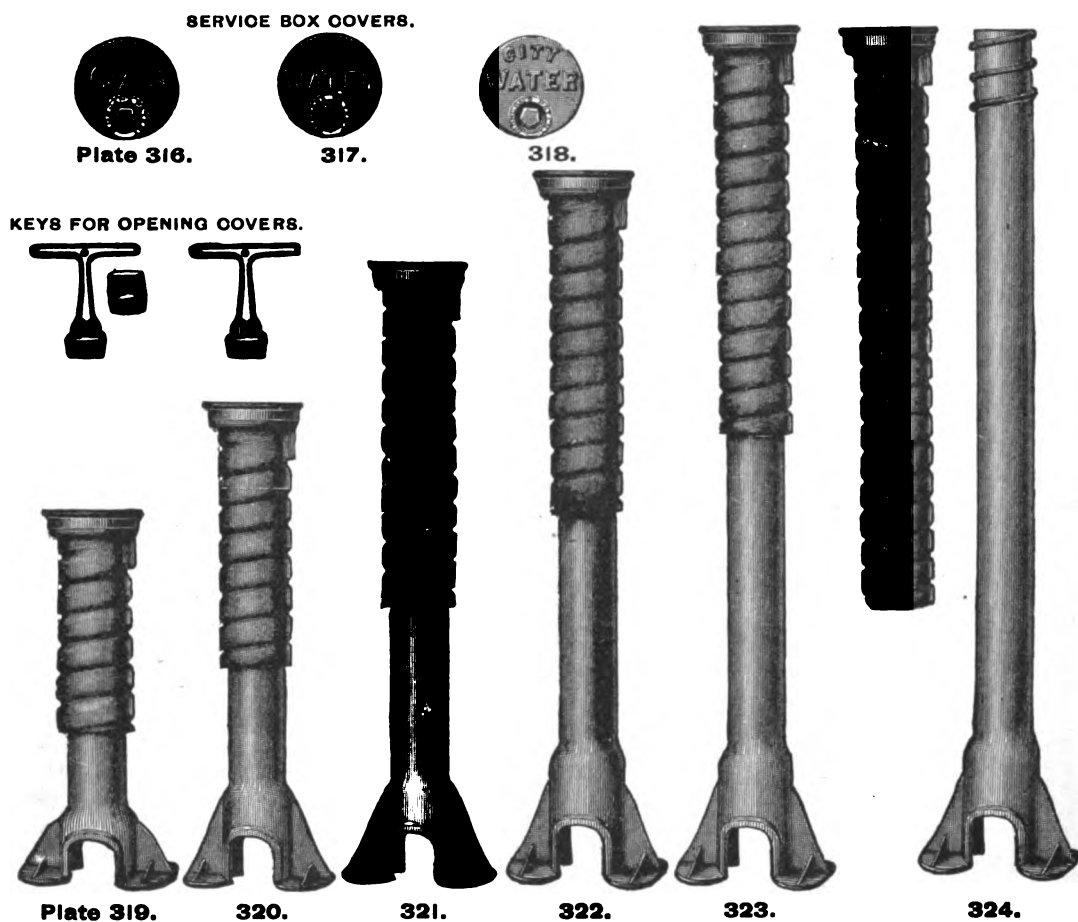
The above prices are based on our Standard Length, viz., five feet from ground surface to bottom of Connecting Pipe. Frost Cases are furnished if wanted, though experience has shown that with our Rubber-Faced Gate they are not needed to prevent freezing.

IN ORDERING HYDRANTS,

- 1st. Give diameter of Stand Pipe.
- 2d. Give length of Hydrant from surface of ground to bottom of Connecting Pipe.
- 3d. Give size of bottom connection.
- 4th. Give number and size of Nozzles, and either exact diameter at top and bottom of Nozzle thread, and number of threads to the inch, or send a sample Nozzle or Nozzle Cap; or refer to some Standard that we may have.
- 5th. State kind of Nut; whether four or five sided, and length of side.
- 6th. State whether you wish to open the Hydrant by turning to the right like the hands of a watch, or to the left.

NEW PATTERN EXTENSION SERVICE BOXES.

IMPROVED SHAPE OF EXTENSION THREADS, DESIGNED TO ALLOW THE GREATEST CAPACITY ATTAINABLE FOR FROST EXPANSION.



FOR ORDINARY SERVICE COCKS UP TO 1 1/4 INCH.

Size.	Weight.	Price.	Extension.	Size.	Weight.	Price.	Extension.
88-	10 lbs.	\$0 90	1 ft. stationary length.	93-E	22 1/2 lbs.	\$1 35	3 ft. to 4 ft. 6 in.
89-A	12 lbs.	1 00	1 ft. to 1 ft. 8 in.	94-D	23 1/2 lbs.	1 40	3 ft. 6 in. to 4 ft. 9 in.
90-B	13 1/2 lbs.	1 05	1 ft. 6 in. to 2 ft. 2 in.	94-E	25 lbs.	1 45	3 ft. 6 in. to 5 ft.
91-C	16 1/2 lbs.	1 15	1 ft. 9 in. to 2 ft. 9 in.	95-E	29 lbs.	1 55	4 ft. to 5 ft. 6 in.
92-C	18 lbs.	1 20	2 ft. to 3 ft. 2 in.	100-E	30 1/2 lbs.	1 80	4 ft. 6 in. to 6 ft.
92-D	19 1/2 lbs.	1 25	2 ft. to 3 ft. 6 in.	100-F	32 1/2 lbs.	2 00	4 ft. 6 in. to 6 ft. 6 in.
93-D	21 lbs.	1 30	3 ft. to 4 ft.	100-Fx	42 lbs.	2 40	6 ft. 6 in. to 8 ft. 6 in.

All our boxes are coated with coal tar inside and outside to protect from rust, etc.

One key for opening covers supplied free of charge.

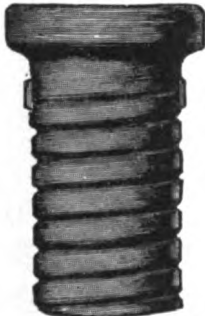
VALVE BOXES.

REGULAR COVERS.
COVERS 7 1-2 INCHES DIAMETER.

**Plate 325.****Plate 326.**

OUTSIDE DIAMETER HEAD, 9 INCHES.
Sections forming 5 1-4 Inch Valve Box.

UPPER SECTION.



MIDDLE SECTION.



NO. 6 OVAL BASE.

**Plate 328.**

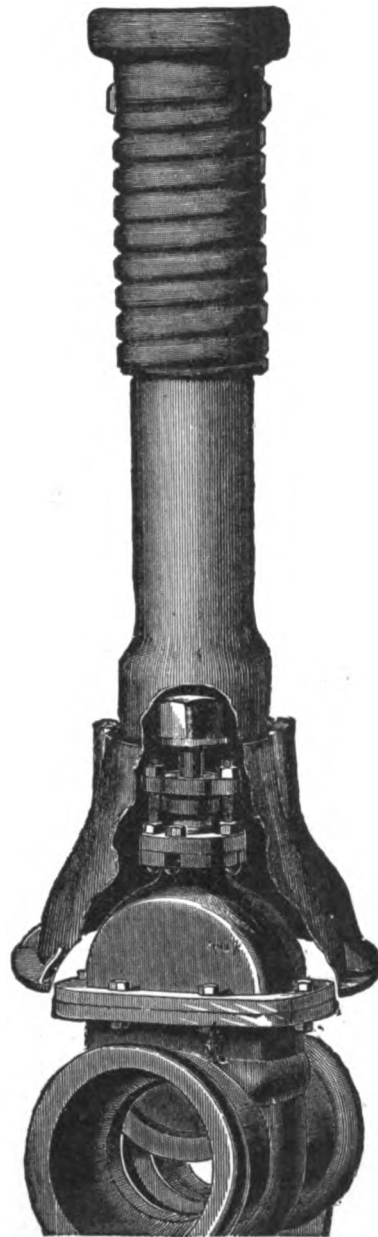
SPECIAL FLANGED COVER.

**Plate 327.**

The regular cover is generally used; when preferred the flange cover will be furnished at same price.

**Plate 329.**

We also make our valve boxes with square head when required, being preferred by some for paved streets.

**Plate 330.****DIRECTIONS FOR SETTING VALVE BOX.**

When setting a Valve Box in its place, the base should rest two or more inches above the flanged joints of the valve dome. The nut of valve should be about on a line with the hub or upper part of the valve box base where connected with upright shaft; this will leave ample space all around valve, and prevent box touching it in any way.

We recommend the use of a larger size base over valves. In many places our No. 4 or No. 6 base is used on 16-inch valves and under; when such is the case the valves are covered by earth to within 12 inches of the top of the nut, the base of valve box completely protecting the working parts of the valve.

For List, see next page.

VALVE BOXES.

LIST OF SIZES, 5 1-4 INCH VALVE BOXES.

WITH NO. 6 BASE.

	Weight	Price
AAA, Stationary length, 1 ft. 5 in., 68 pounds		\$3 10
AA, Extends 1 ft. 10 in. to 2 ft. 4 in., 87 pounds		3 60
A, Extends 2 ft. 4 in. to 3 ft. 4 in., 93 pounds		4 15
B, Extends 3 ft. to 4 ft., 100 pounds		4 35
C, Extends 3 ft. 6 in. to 4 ft. 6 in., 106 pounds		4 60
CC, Extends 4 ft. to 5 ft., 112 pounds		4 90
D, Extends 3 ft. 6 in. to 5 ft. 5 in., 115 pounds		5 20
DD, Extends 4 ft. to 6 ft., 120 pounds		5 50
E, Extends 5 ft. to 6 ft., 125 pounds		5 65
F, Extends 5 ft. to 7 ft., 130 pounds		5 85
G, Extends 6 ft. to 7 ft., 137 pounds		6 00
H, Extends 6 ft. to 8 ft., 140 pounds		6 38

Base No. 6 is used as a standard for quoting lengths and prices on Valve Boxes. When any other size base is required, the length of Valve Box and price of same is either reduced or increased in accordance with the size base desired.

SIZES OF THE DIFFERENT BASES ADAPTED FOR USING WITH THE ABOVE VALVE BOX.

No. 6. Round Base, for 6-inch round valves or smaller sizes. This is the standard size, used in quoting lengths and prices. Dimensions inside: diameter at bottom, $14\frac{3}{8}$ inches; height, 11 inches.

No. 4. Round Base, for 4-inch valves or smaller sizes, reduces price of Valve Box 25 cents. Dimensions inside: diameter at bottom, $10\frac{3}{4}$ inches; height, 8 inches. With this base the Valve Box will be 3 inches shorter than with No. 6 base.

No. 8. Round Base, for 8-inch round valves or smaller sizes, increases price of Valve Box 25 cents. Dimensions inside: diameter at bottom, $17\frac{1}{4}$ inches; height, 11 inches. With this base the Valve Box is the same length as with No. 6 base.

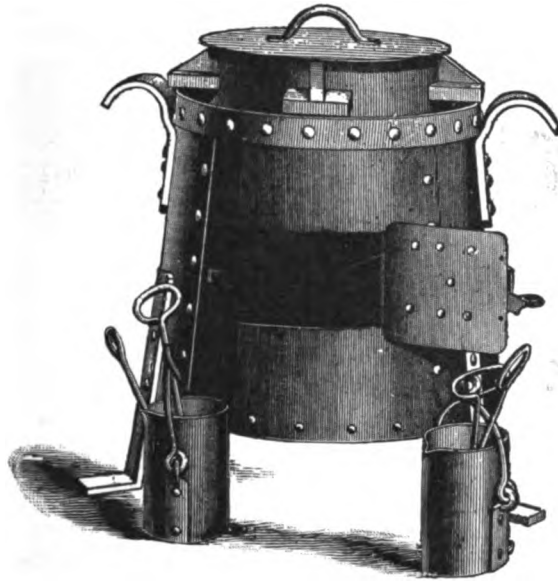
No. 16. Round Base, for 12 or 16 inch round valves, increases price of Valve Box \$1.25. Dimensions inside: diameter at bottom, 24 inches; height, $15\frac{1}{4}$ inches. With this base the Valve Box is $4\frac{3}{8}$ inches longer than with No. 6 base.

No. 6. Oval Base, for 8-inch oval valves or smaller sizes. This is the standard size, used in quoting lengths and prices. Dimensions inside: diameter at bottom, 15 inches by $11\frac{1}{8}$ inches; height, 11 inches.

No. 140. Round Dome Base, with flange, 17 inches square. This base is especially adapted for using when valves are set near surface, for any valve up to 24 inches. Reduces length of box 6 inches. Price same as No. 6 base.

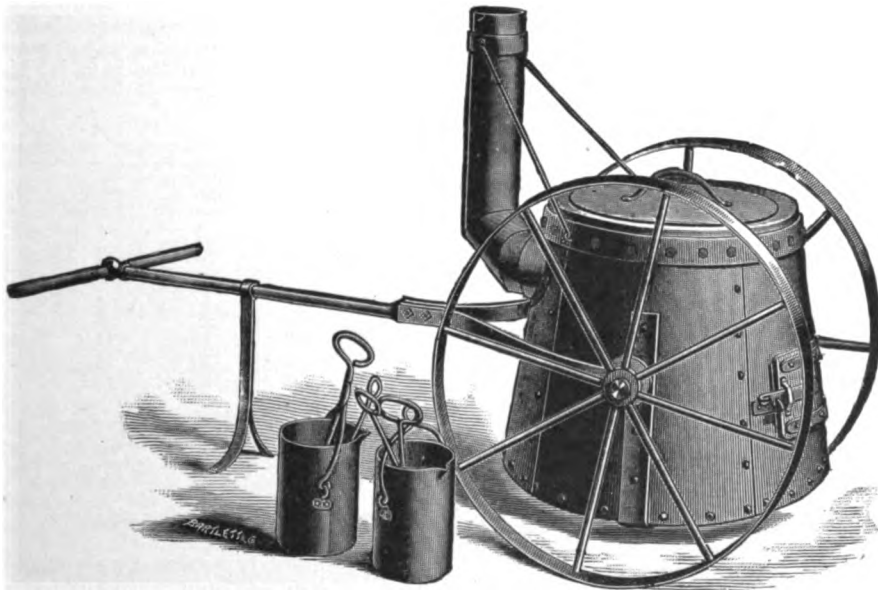
No. 160. Oval Base, for 16-inch valves or smaller sizes, increases price of Valve Box 50 cents. Dimensions inside: diameter at bottom, 21 inches by $12\frac{1}{2}$ inches; height, $9\frac{1}{2}$ inches. With this base the Valve Box is $1\frac{1}{2}$ inches shorter than with No. 6 base.

No. 162. Oval Base for 20-inch valves or smaller sizes, increases price of Valve Box \$2.50. Dimensions inside: diameter at bottom, 28 inches by 16 inches; height, 10 inches. With this base the Valve Box is 1 inch shorter than with No. 6 base.

LEAD MELTING FURNACE.**Plate 331.**

Outfit consists of all shown in cut: One melting furnace complete with grate bars, melting pot capable of holding 400 pounds lead, two pouring pots with two hooks each (one long and one short). Total weight of outfit, 350 pounds.

Price, complete, each \$25 00

MELTING FURNACE MOUNTED ON WHEELS.**Plate 332.**

This outfit is furnished complete, as shown in cut, and can be readily moved from place to place without drawing the fire and with melted lead in pot.

Price, each \$50 00

NASH WATER METER.

WITH STRAIGHT-READING REGISTER.

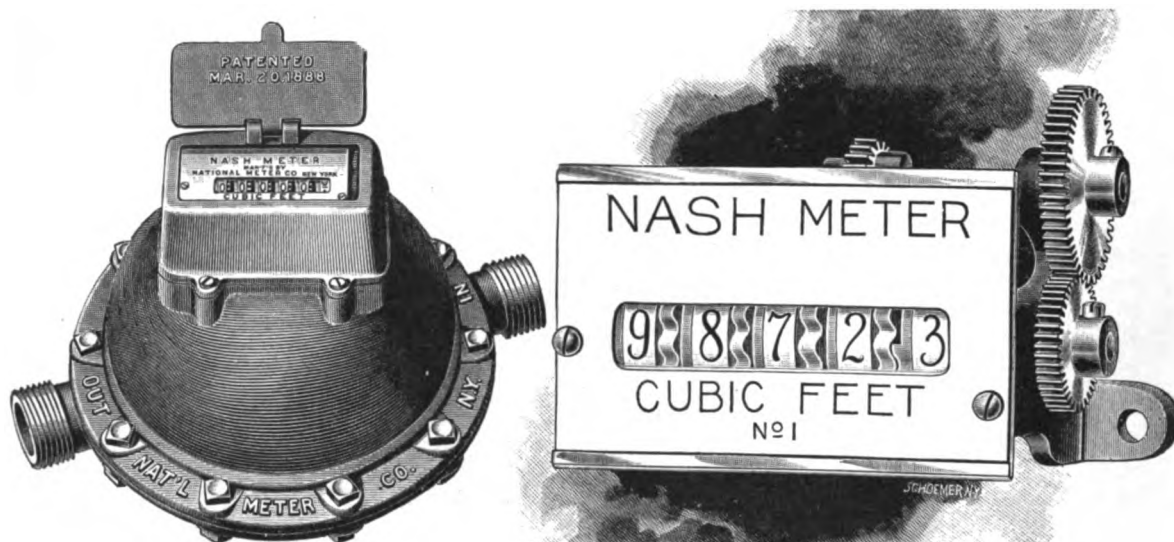


Plate 333.

STRAIGHT-READING REGISTER.

The name of this device tells its purpose in a few words. As seen from the illustration here shown, it is so constructed that the figures appear right in a straight line. No previous instructions are required, and nothing could be simpler. The value and utility of a simple and reliable Water Meter Register are admitted on all sides. There are now many thousands of these Straight-Reading Registers in use, and the rapidly-increasing demand for them is the best evidence of their popularity. The Straight-Reading Register has been thoroughly and satisfactorily tested for accuracy and durability, and its absolute reliability has been demonstrated by its extensive use in every section of the country. All Nash Meters up to and including the 2 inch size are fitted with Straight-Reading Registers. The Meters so arranged are classified as "AA" Nash. Unless instructed to the contrary, we always send "AA" Meters in the sizes just mentioned.

The "AA" Nash Meters are of the same construction as the "A" style in the $\frac{1}{2}$ or $\frac{5}{8}$, $\frac{3}{4}$ and 1 inch sizes, with the exception of the Straight-Reading Register, which takes the place of the round porcelain dial.

Dimensions and Weights.

Size	Greatest proper Quantity per minute	Price	Con-nections	Length, Inches	Height over all, Inches	Width, Inches	Weight, Pounds	Weight boxed, Pounds
$\frac{1}{2}$ or $\frac{5}{8}$ in.	2 cubic ft. or 15 gals.	\$ 10 80	\$.40	7 $\frac{1}{4}$	7 $\frac{1}{4}$	5 $\frac{5}{8}$	10	14
$\frac{3}{4}$ in.	4 cubic ft. or 30 gals.	15 60	.60	9 $\frac{1}{4}$	7 $\frac{3}{4}$	7	14	20
1 in.	8 cubic ft. or 60 gals.	20 40	.90	10 $\frac{7}{8}$	8 $\frac{1}{2}$	8 $\frac{5}{8}$	21	28
1 $\frac{1}{2}$ in.	12 cubic ft. or 90 gals.	42 00	.....	12 $\frac{5}{8}$	11	7 $\frac{5}{8}$	35	49
2 in.	20 cubic ft. or 150 gals.	66 00	.....	15 $\frac{1}{4}$	12	9 $\frac{1}{2}$	54	72
3 in.	36 cubic ft. or 270 gals.	108 00	.....	24	15 $\frac{1}{2}$	11 $\frac{1}{2}$	106	131
4 in.	72 cubic ft. or 540 gals.	240 00	.....	29	19	14 $\frac{1}{4}$	200	240
6 in.	120 cubic ft. or 900 gals.	480 00	.....	38	25	18	400	445

Connections are made only for $\frac{1}{2}$ inch or $\frac{5}{8}$ inch, $\frac{3}{4}$ inch and 1 inch meters, and are always sent with these sizes, unless we are otherwise instructed. These sizes are made with male threads, while the $1\frac{1}{2}$ inch and 2 inch meters have female threads. All threads are cut to fit standard pipe. The 3, 4 and 6 inch meters are made with flanges.

The prices of flanges drilled, faced, with bolts and packings, per set, are:

3 inch, \$1.00; 4 inch, \$1.50; 6 inch, \$2.00.

Fish Traps are made for all sizes of all our meters, and their use is particularly recommended in connection with the sizes above $1\frac{1}{2}$ inch, since they afford valuable protection against any foreign substance that is liable to work into the meters from the street main, and damage or destroy the working parts.

The prices of Fish Traps are: $\frac{1}{2}$ or $\frac{5}{8}$ inch, $\frac{3}{4}$ inch and 1 inch, \$6.00; $1\frac{1}{2}$ inch and 2 inch, \$8.00; 3 inch, \$12.50; 4 inch, \$18.00; 6 inch, \$25.00.

N. B.—For economy in transportation, $\frac{1}{2}$ or $\frac{5}{8}$ inch, $\frac{3}{4}$ inch and 1 inch meters are packed five in a box, when orders will admit. Such packages weigh respectively, 65 pounds, 95 pounds, 145 pounds.

CROWN WATER METER

WITH STRAIGHT-READING REGISTER.

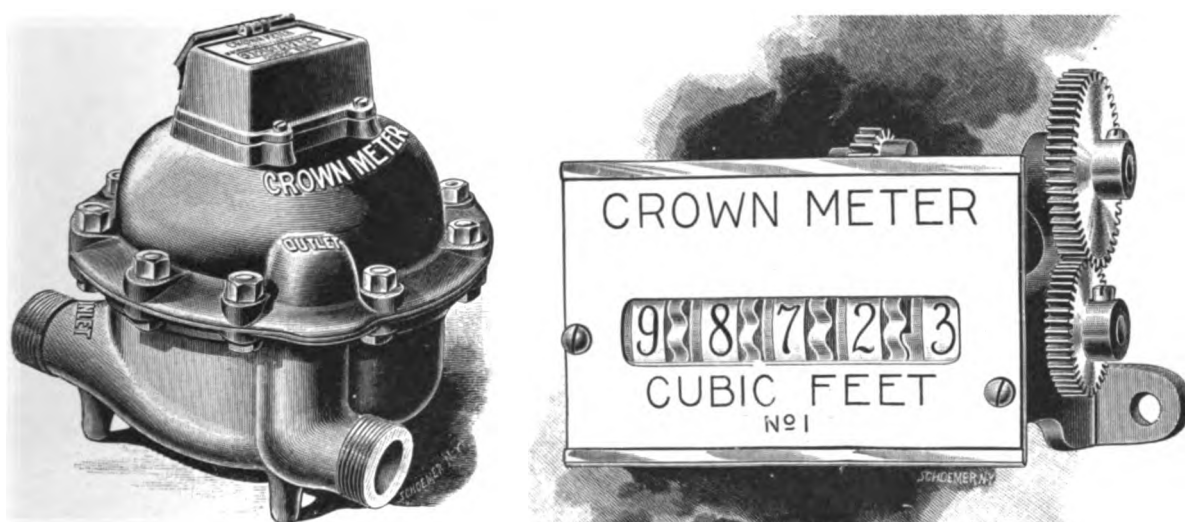


Plate 334.

STRAIGHT-READING REGISTER.

The name of this device tells its purpose in a few words. As seen from the illustrations here shown, it is so constructed that the figures appear right in a straight line. Any child who understands figures will thus be able to read the Register without the slightest difficulty. No previous instructions are required, and nothing could be simpler. The value and utility of a simple and reliable Water Meter Register are admitted on all sides. There are now many thousands of these Straight-Reading Registers in use, and the rapidly increasing demand for them is the best evidence of their popularity. The Straight-Reading Register has been thoroughly and satisfactorily tested for accuracy and durability, and its absolute reliability has been demonstrated by its extensive use in every section of the country. All Crown Meters up to and including the 2-inch size are fitted with Straight-Reading Registers. The Meters so arranged are classified as "AA" Crown. Unless instructed to the contrary, we always send "AA" Meters in the sizes just mentioned.

The "AA" Crown Meters are of the same construction as the "A" style in the $\frac{3}{8}$, $\frac{1}{2}$ or $\frac{5}{8}$, $\frac{3}{4}$ and 1-inch sizes, with the exception of the Straight-Reading Register, which takes the place of the round porcelain dial.

			Dimensions and Weight.						
Size	Greatest Proper Quantity per Minute	Price	Con- nections	Length Inches	Height over all Inches	Width Inches	Weight Pounds	Weight boxed Pounds	
$\frac{3}{8}$ in.	1 cubic ft. or 7½ gals.	\$12 00	\$0 30	6	7 $\frac{3}{8}$	5 $\frac{5}{8}$	10	14	
$\frac{1}{2}$ or $\frac{5}{8}$ in.	2 cubic ft. or 15 gals.	14 40	40	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7	17	23	
$\frac{3}{4}$ in.	4 cubic ft. or 30 gals.	22 80	60	9	8 $\frac{3}{4}$	8 $\frac{3}{4}$	30	40	
1 in.	8 cubic ft. or 60 gals.	32 40	90	10 $\frac{7}{8}$	10 $\frac{1}{4}$	10	49	63	
1½ in.	12 cubic ft. or 90 gals.	60 00	.....	12 $\frac{5}{8}$	12	11	59	74
2 in.	20 cubic ft. or 150 gals.	78 00	.....	15 $\frac{1}{4}$	14 $\frac{1}{8}$	12 $\frac{3}{4}$	102	120
3 in.	36 cubic ft. or 270 gals.	162 00	.....	24	16 $\frac{1}{2}$	15 $\frac{1}{2}$	214	229
4 in.	72 cubic ft. or 540 gals.	300 00	.....	29 $\frac{1}{4}$	20 $\frac{1}{2}$	21	440	460
6 in.	120 cubic ft. or 900 gals.	600 00	.....	36 $\frac{3}{4}$	28 $\frac{1}{2}$	29	965	995

We make Meters with Extension Dials, and prices will be furnished on application.

Connections are made only for $\frac{3}{8}$ -inch, $\frac{1}{2}$ or $\frac{5}{8}$ -inch, $\frac{3}{4}$ -inch and 1-inch Meters, and are always sent with these sizes, unless we are otherwise instructed. These sizes are made with male threads, while the $1\frac{1}{2}$ -inch and 2-inch Meters have female threads. All threads are cut to fit standard pipe. The 3, 4 and 6-inch Meters are made with flanges.

The prices of flanges, drilled, faced, with bolts, and packings, per set, are: 3-inch, \$1.00; 4-inch, \$1.50; 6-inch, \$2.00.

Fish Traps are made for all sizes of all our Meters, and their use is particularly recommended in connection with the sizes above $1\frac{1}{2}$ -inch, since they afford valuable protection against any foreign substance that is liable to work into the Meters from the street main, and damage or destroy the working parts.

The prices of Fish Traps are: $\frac{3}{8}$ -inch, $\frac{1}{2}$ or $\frac{5}{8}$ -inch, $\frac{3}{4}$ -inch and 1-inch, \$6.00 each; $1\frac{1}{2}$ -inch and 2-inch, \$8.00; 3-inch, \$12.50; 4-inch, \$18.00; 6-inch, \$25.00.

N. B.—For economy in transportation, $\frac{3}{8}$ -inch, $\frac{1}{2}$ or $\frac{5}{8}$ -inch, $\frac{3}{4}$ -inch and 1-inch Meters are packed five in a box, when orders will admit. Such cases weigh, respectively, 67 lbs., 115 lbs., 180 lbs., 302 lbs.

GEM WATER METER

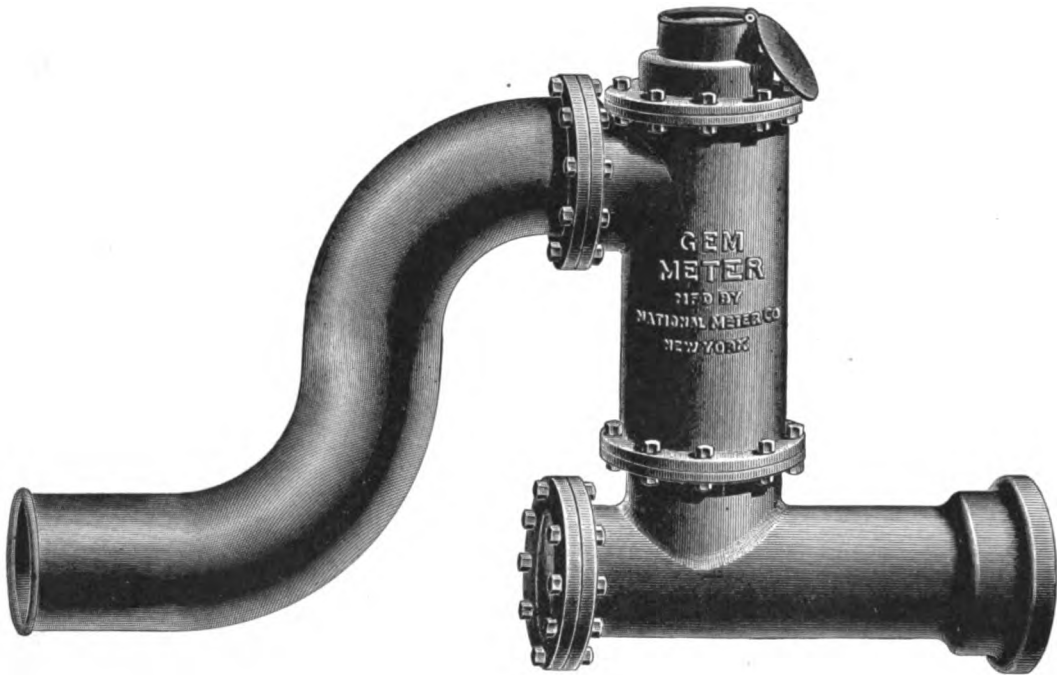


Plate 335.

Size.	Quantity of water discharged under 60 pounds pressure.	Height of Meter.	Distance from end to end of connections.	Weight of Meter with connections.	Price, complete, with connections.
2 inch.	32 cubic feet or 240 gals. a minute.	12 in.	14 $\frac{5}{8}$ in.	45 lbs.	\$ 54 00
3 inch.	72 cubic feet or 540 gals. a minute.	16 in.	36 $\frac{1}{2}$ in.	135 lbs.	108 00
4 inch.	128 cubic feet or 960 gals. a minute.	22 in.	43 $\frac{1}{2}$ in.	235 lbs.	210 00
6 inch.	288 cubic feet or 2,160 gals. a minute.	25 in.	56 in.	445 lbs.	480 00
8 inch.	550 cubic feet or 4,125 gals. a minute.	33 in.	40 in.	1,300 lbs.	840 00
10 inch.	800 cubic feet or 6,000 gals. a minute.	33 in.	76 in.	2,200 lbs.	1,080 00

Connections are furnished for either cast or wrought iron pipe. Owing to the peculiar shape of the Connections, we always send them with the Meters, unless we have instructions to the contrary. Each size of the Gem Meter is fitted with screen and blow-off. The 10 inch size is adapted for use in conjunction with 10 or 12 inch pipes. The extra Connections necessary for 12 inch pipe are furnished without additional charge.

We now have under construction Gem Meters in sizes up to 48 inch. Prices, dimensions and other information will be furnished upon application.

LEAD PIPE.

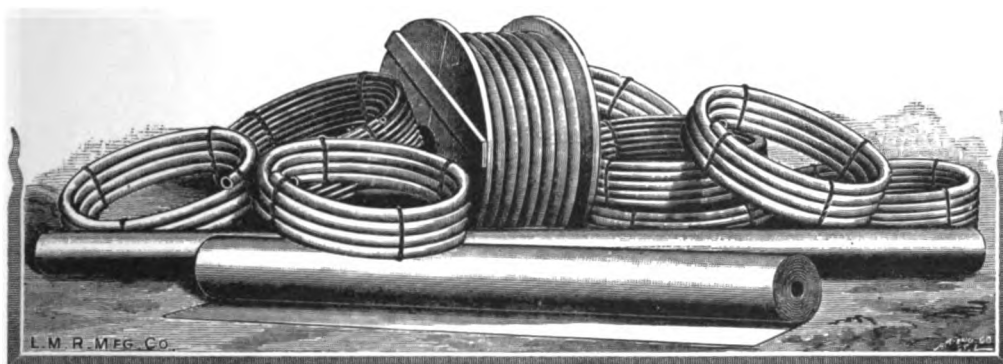
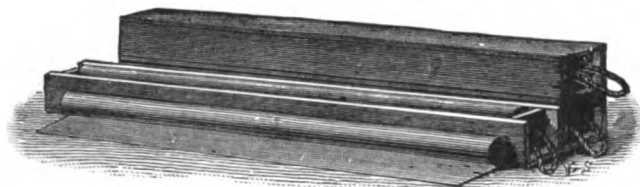


Plate 336.

Caliber		Weight per Foot		Caliber		Weight per Foot	
		Pounds	Ounces			Pounds	Ounces
$\frac{1}{8}$ inch	Tubing		$3\frac{1}{2}$	$1\frac{1}{4}$ inch	Strong	4	12
$\frac{1}{4}$ inch	Extra Light Tubing	4		$1\frac{1}{4}$ inch	Extra Strong	6	0
$\frac{1}{4}$ inch	Light Tubing	6		$1\frac{1}{2}$ inch	Aqueduct	3	0
$\frac{1}{4}$ inch	Medium Tubing	8		$1\frac{1}{2}$ inch	Extra Light	3	8
$\frac{1}{4}$ inch	Strong Tubing	10		$1\frac{1}{2}$ inch	Light	4	0
$\frac{1}{4}$ inch	Extra Strong	1	2	$1\frac{1}{2}$ inch	Medium	5	0
$\frac{3}{8}$ inch	Aqueduct	0	8	$1\frac{1}{2}$ inch	Strong	6	0
$\frac{3}{8}$ inch	Light	0	12	$1\frac{1}{2}$ inch	Extra Strong	7	8
$\frac{3}{8}$ inch	Medium	1	0	$1\frac{3}{4}$ inch	Extra Light	3	12
$\frac{3}{8}$ inch	Strong	1	8	$1\frac{3}{4}$ inch	Light	4	8
$\frac{3}{8}$ inch	Extra Strong	2	0	$1\frac{3}{4}$ inch	Medium	5	8
$\frac{1}{2}$ inch	Aqueduct	0	10	$1\frac{3}{4}$ inch	Strong	6	8
$\frac{1}{2}$ inch	Extra Light	0	12	$1\frac{3}{4}$ inch	Extra Strong	8	0
$\frac{1}{2}$ inch	Light	1	0	2 inch	Waste	3	0
$\frac{1}{2}$ inch	Medium	1	4	2 inch	Extra Light	4	0
$\frac{1}{2}$ inch	Strong	1	12	2 inch	Light	5	0
$\frac{1}{2}$ inch	Extra Strong	2	8	2 inch	Medium	7	0
$\frac{5}{8}$ inch	Aqueduct	0	12	2 inch	Strong	8	0
$\frac{5}{8}$ inch	Extra Light	1	4	2 inch	Extra Strong	9	0
$\frac{5}{8}$ inch	Light	1	12	$2\frac{1}{2}$ inch	$\frac{1}{8}$ thick	8	0
$\frac{5}{8}$ inch	Medium	2	0	$2\frac{1}{2}$ inch	$\frac{1}{4}$ thick	11	0
$\frac{5}{8}$ inch	Strong	2	8	$2\frac{1}{2}$ inch	$\frac{3}{8}$ thick	14	0
$\frac{5}{8}$ inch	Extra Strong	3	0	$2\frac{1}{2}$ inch	$\frac{1}{2}$ thick	17	0
$\frac{3}{4}$ inch	Aqueduct	1	0	3 inch	Waste	5	0
$\frac{3}{4}$ inch	Extra Light	1	8	3 inch	$\frac{3}{8}$ thick	9	0
$\frac{3}{4}$ inch	Light	2	0	3 inch	$\frac{1}{4}$ thick	12	0
$\frac{3}{4}$ inch	Medium	2	4	3 inch	$\frac{3}{8}$ thick	16	0
$\frac{3}{4}$ inch	Strong	3	0	3 inch	$\frac{1}{2}$ thick	20	0
$\frac{3}{4}$ inch	Extra Strong	3	8	$3\frac{1}{2}$ inch	$\frac{1}{4}$ thick	15	0
1 inch	Aqueduct	1	8	$3\frac{1}{2}$ inch	$\frac{3}{8}$ thick	18	0
1 inch	Extra Light	2	0	$3\frac{1}{2}$ inch	$\frac{1}{2}$ thick	21	0
1 inch	Light	2	8	4 inch	Waste	5	0
1 inch	Medium	3	4	4 inch	$\frac{1}{8}$ thick	7	0
1 inch	Strong	4	0	4 inch	$\frac{1}{4}$ thick	16	0
1 inch	Extra Strong	4	12	4 inch	$\frac{3}{8}$ thick	21	0
$1\frac{1}{4}$ inch	Aqueduct	2	0	4 inch	$\frac{1}{2}$ thick	25	0
$1\frac{1}{4}$ inch	Extra Light	2	8	4 inch	$\frac{3}{4}$ thick	25	0
$1\frac{1}{4}$ inch	Light	3	0	4 inch	$\frac{1}{2}$ thick	30	0
$1\frac{1}{4}$ inch	Medium	3	12	$4\frac{1}{2}$ inch	Waste	6	0
				5 inch	Waste	8	0

PURE BLOCK TIN PIPE.

Caliber		Weight per Foot		Caliber		Weight per Foot	
		Ounces				Pounds	Ounces
$\frac{1}{8}$ inch	Strong	$2\frac{1}{2}$		$\frac{1}{2}$ inch	Double Extra Strong		15
$\frac{1}{4}$ inch	Extra Strong	5		$\frac{5}{8}$ inch	Extra Strong		9
$\frac{1}{4}$ inch	Double Extra Strong	$6\frac{1}{2}$		$\frac{5}{8}$ inch	Double Extra Strong		14
$\frac{1}{2}$ inch	Double Extra Strong	$6\frac{1}{2}$		$\frac{3}{4}$ inch	Extra Strong		11
$\frac{3}{8}$ inch	Extra Strong	6		$\frac{3}{4}$ inch	Double Extra Strong	1	0
$\frac{3}{8}$ inch	Double Extra Strong	8		1 inch	Extra Strong		14
$\frac{1}{2}$ inch	Strong	$6\frac{1}{2}$		1 inch	Double Extra Strong	1	4
$\frac{1}{2}$ inch	Extra Strong	10					

SHEET LEAD.**Plate 337.****WEIGHTS AND SIZES OF SHEET LEAD.**

Pounds per square foot . . .	2½	3	3½	4	4½	5	6	7	8	9	10	11	12
Wire Gauge No.	19	18	17	16	15	14	13	12	11	10	9	8	7

Sheet Lead rolled to any other weight per square foot to order.

(A square foot of Sheet Lead 1-16 of an inch thick weighs four pounds.)

We make a specialty of Chemical Sheet Lead.

LEAD MOULDING.

FOR ORNAMENTAL GLASS WINDOWS.

**Plate 338.**

For ⅛ Glass; weight, 3½ ounces per foot . . . . .	.....
For 1⁄8 Glass; weight, 3½ ounces per foot . . . . .	.....
For ¼ Glass; weight, 4 ounces per foot . . . . .	.....

LEAD GASKET.

FOR MANHEADS.

DOUBLE BEAD.

**Plate 339.**

Lead Gaskets of all sizes kept in stock. In ordering, give inside circumference.

LEAD SASH WEIGHTS.**Plate 340.****Plate 341.**

We can furnish Sash Weights of any length or diameter desired.

CORRUGATED
ROUND.

Plate 342.

CONDUCTOR PIPE.**GALVANIZED EXPANDING CONDUCTOR.**

In 10 feet seamless lengths, has no soldered joints, not affected by expansion or contraction.

CORRUGATED ROUND.

2 inches diameter	12 cents per foot
3 inches diameter	15 cents per foot
4 inches diameter	20 cents per foot
5 inches diameter	25 cents per foot
6 inches diameter	30 cents per foot

The above quotations are for No. 28 Gauge Galvanized Iron.

For No. 27 Gauge, add	1 cent per foot
For No. 26 Gauge, add	2 cents per foot
For No. 24 Gauge, add	6 cents per foot

Plain round pipe takes same list as corrugated.

ELBOWS AND SHOES.No. 1.
ELBOW.

Plate 343.

No. 2.
ELBOW.

Plate 344.

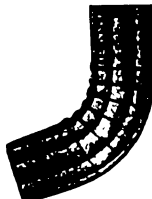
No. 3.
ELBOW.

Plate 345.

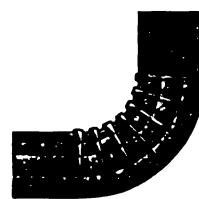
No. 4.
ELBOW.

Plate 346.

SHOE.



Plate 347.

Elbows, 2 inch, each	25 cents; Shoes, each	30 cents
Elbows, 3 inch, each	30 cents; Shoes, each	36 cents
Elbows, 4 inch, each	40 cents; Shoes, each	48 cents
Elbows, 5 inch, each	50 cents; Shoes, each	60 cents
Elbows, 6 inch, each	60 cents; Shoes, each	72 cents

Prices for Copper Conductor Pipe and Elbows quoted on application.

GALVANIZED HOOKS FOR CONDUCTOR PIPE.

2 inch, per dozen, net	20 cents
3 inch, per dozen, net	30 cents
4 inch, per dozen, net	45 cents
5 inch, per dozen, net	65 cents
6 inch, per dozen, net	85 cents

Corrugated Conductor Pipe will not burst when full of ice.

RITCHIE'S GALVANIZED SPIRAL LOCK SEAM PIPE.



Plate 348.

Diameter	1	1¼	1½	2	2½	3	4	5	5½	6 in.
Per foot	\$0 08	11	12	14	17	19	25	30	34	38

ADJUSTABLE ELBOWS.

GALVANIZED IRON.



Plate 349.



Plate 350.



Plate 351.

Size	1½	2	2½	3	4	5	5½	6	7	8	10 in.
Per doz.	\$2 40	2 40	3 00	3 60	4 80	6 60	7 80	8 40	10 20	13 80	16 80

For all classes of work, where lightness and strength are desirable, this Pipe is superior to any other. It has greater power to resist pressure, and is less liable to be bruised, as the spiral seam forms a substantial rib and acts as a guard or brace.

It is rounder, stiffer and more easily fitted than any other. and therefore unequalled for use in ventilation by plumbers and others.

Conductors or down-spouts made from this pipe can be put up without soldering, saving much time and expense.

It is manufactured in ten-foot lengths, each of which is enlarged at one end, a groove being formed on the inside, so that the seam on the outside of a small end will screw into the groove in an enlarged end, thus forming a secure coupling without soldering.

Sheet-metal workers can realize a profit by supplying their customers with this Pipe, and in addition save the time and trouble of manufacturing.

Architects who specify it, can feel certain that they give their clients a first-class article. It is well made from the best materials and galvanized after formation.

STEAM AND GAS FITTERS AND BOILER MAKERS' SUPPLIES.

WROUGHT IRON PIPE.



Plate 352.

PLAIN AND GALVANIZED, FOR GAS, STEAM OR WATER.

1¼ inch and below, Butt Welded; proved to 300 pounds per square inch, hydraulic pressure.
1½ inch and above, Lap Welded; proved to 500 pounds per square inch, hydraulic pressure.

Nominal Size Inside Diameter.	Price per foot Black.	Price per foot Galvan'd.	Thick- ness. Inches.	Nominal Weight per foot. Pounds.	No. of Threads per inch of Screw.
½ inch	\$0 05½	08	.068	.24	27
¾ inch	05½	07½	.088	.42	18
⅝ inch	05½	07½	.091	.56	18
½ inch	07	09½	.109	.84	14
¾ inch	08½	11½	.113	1.12	14
1 inch	11¾	16	.134	1.67	11½
1¼ inch	15½	22	.140	2.24	11½
1½ inch	26	31	.145	2.68	11½
2 inch	35	42	.154	3.61	11½
2½ inch	52	62	.204	5.74	8
3 inch	68	80	.217	7.54	8
3½ inch	81	98	.226	9.00	8
4 inch	95	1 16	.237	10.66	8
4½ inch	1 25	1 50	.246	12.49	8
5 inch	1 42	1 75	.259	14.50	8
6 inch	1 85	2 20	.280	18.76	8
7 inch	2 45	3 00	.301	23.27	8
8 inch	2 95	3 70	.322	28.18	8
9 inch	3 75	.....	.344	33.70	8
10 inch	4 75	.....	.366	40.00	8
11 inch	6 00	.....	.375	45.00	8
12 inch	7 00	.....	.375	49.00	8
13 inch	8 50	.....	.375	54.00	8
14 inch	10 00	.....	.375	58.00	8
15 inch	12 00	.....	.375	62.00	8

Subject to change without notice.

Taper of Threads, 1 to 32 on each side.

Pipe cut to specific lengths to suit purchasers, at an extra charge.

EXTRA STRONG WROUGHT IRON PIPE.**WITHOUT THREADS OR COUPLINGS.**

Nominal Inside Diameter	Price Per Foot.	Actual Outside Diameter, Inches.	Actual Inside Diameter, Inches.	Thickness, Inches.	Weight per Foot, Pounds.
$\frac{1}{8}$ inch	\$0 11	.405	.205	.100	.29
$\frac{1}{4}$ inch	11	.54	.294	.123	.54
$\frac{3}{8}$ inch	11	.675	.421	.127	.74
$\frac{1}{2}$ inch	14	.84	.542	.149	1.09
$\frac{3}{4}$ inch	17	1.05	.736	.157	1.39
1 inch	23 $\frac{1}{2}$	1.315	.951	.182	2.17
1 $\frac{1}{4}$ inch	31	1.66	1.272	.194	3.00
1 $\frac{1}{2}$ inch	52	1.90	1.494	.203	3.65
2 inch	70	2.375	1.933	.221	5.02
2 $\frac{1}{2}$ inch	1 04	2.875	2.315	.280	7.67
3 inch	1 36	3.50	2.892	.304	10.25
3 $\frac{1}{2}$ inch	1 62	4.00	3.358	.321	12.47
4 inch	1 90	4.50	3.82	.341	14.97
4 $\frac{1}{2}$ inch	2 50	.....	.....	.....	.....
5 inch	2 84	5.563	4.813	.375	20.54
6 inch	3 70	6.625	5.750	.437	28.58

DOUBLE EXTRA STRONG.

Nominal Inside Diameter.	Price Per foot.	Actual Outside Diameter, Inches.	Actual Inside Diameter, Inches.	Thickness, Inches.	Weight per Foot, Pounds.
$\frac{1}{2}$ inch	\$0 28	.84	.24	.30	1.70
$\frac{3}{4}$ inch	34	1.05	.42	.31	2.44
1 inch	47	1.315	.58	.36	3.65
1 $\frac{1}{4}$ inch	62	1.66	.88	.39	5.20
1 $\frac{1}{2}$ inch	1 04	1.90	1.09	.41	6.40
2 inch	1 40	2.375	1.49	.44	9.02
2 $\frac{1}{2}$ inch	2 73	2.875	1.75	.56	13.68
3 inch	3 57	3.50	2.28	.61	18.56
3 $\frac{1}{2}$ inch	4 25	4.00	2.76	.64	22.75
4 inch	5 00	4.50	3.14	.68	27.48
4 $\frac{1}{2}$ inch	6 56	.....	.....	.....	.....
5 inch	7 45	5.563	4.06	.75	38.12
6 inch	9 25	6.625	4.87	.87	53.11

Pipe heavier than the Standards of Extra Strong or Double Extra Strong Pipe will be classed a Hydraulic, and sold by the pound. Prices on application.

Extra and Double Extra Strong Pipe cut to specific lengths at an advanced price.

Threads and Sockets on Extra Strong and Double Extra Strong Pipe will be charged extra.

PIPE CIPHER.

FOR ORDERING BY TELEGRAPH.



Number of feet		Size	Plain	Size	Galvanized
100	Asia	$\frac{1}{8}$	Allegheny		
200	Belgium	$\frac{1}{4}$	Baltimore	$\frac{1}{4}$	Amazon
300	Chili	$\frac{3}{8}$	Camden	$\frac{3}{8}$	Bay
400	Denmark	$\frac{1}{2}$	Detroit	$\frac{1}{2}$	Colorado
500	Egypt	$\frac{3}{4}$	Erie	$\frac{3}{4}$	Danube
600	France	1	Fairmount	1	Elbe
700	Germany	$1\frac{1}{4}$	Galena	$1\frac{1}{4}$	Firth
800	Holland	$1\frac{1}{2}$	Harrisburg	$1\frac{1}{2}$	Ganges
900	Ireland	2	Ithaca	2	Hudson
1,000	Japan	$2\frac{1}{2}$	Jamestown	$2\frac{1}{2}$	Indus
2,000	Kentucky	3	Kensington	3	Juniata
3,000	Liberia	$3\frac{1}{2}$	Lancaster	$3\frac{1}{2}$	Kanawha
4,000	Maine	4	Macon	4	Lake
5,000	Nevada	$4\frac{1}{2}$	Quincy	$4\frac{1}{2}$	Miami
6,000	Ohio	5	Newark	5	Nile
7,000	Peru	6	Oneida	6	Osage
8,000	Russia	7	Paris	7	Po
9,000	Spain	8	Reading	8	Rhine
10,000	Texas	9	Salem	9	Seine
15,000	Uruguay	10	Troy	10	Tweed
20,000	Valparaiso	12	Utica	12	Ural
25,000	Washington				
30,000	Xenia				
40,000	Yorkville				
50,000	Zanesville				

QUERIES.

Ava—At what price can you furnish.....?
 Baro—At what price, and how soon can you furnish.....?
 Congo—Have you in stock and can you furnish.....?
 Don—What is the lowest contract rate of freight you can obtain on.....?
 Ebro—What is the freight per 100 pounds per express on.....?
 Forth—Have you shipped order of.....inst.?
 Gondar—When can you ship.....?

ORDERS.

Atlantic—Ship immediately by express.
 Adriatic—Ship immediately by steamer.
 Biscay—Ship immediately by rail (freight).
 Baltic—Suspend shipment of order of.....inst.
 Carnatic—Suspend work on order of.....inst., until further instructions.
 Caspian—You can vary the lengths, but send not less than.....
 Pacific—You can vary on the thickness, but not more than.....
 Carribbean—Send tracer immediately for shipment of.....

ANSWERS TO QUERIES AND ORDERS.

Alfred—We can furnish you at (price).....
 Bernard—We have in stock, and can furnish at once, at (price).....
 Conrad—We have none in stock, but will make, and ship by.....
 Daniel—Freight by express per 100 lbs. is.....
 Ernest—Freight by rail (freight) in car loads per 100 lbs. is.....
 Frederick—Freight by rail (freight) in less than car loads per 100 lbs. is.....
 Guy—We shipped your order on.....

Arrow—We will ship you immediately order.....
 Bow—We will ship your order on.....
 Cannon—We have suspended shipment of your order of.....
 Dirk—We have suspended work on your order of.....
 Gun—We can (or will) vary the lengths, and will send.....
 Sword—We can (or will) vary the thickness, and will send.....

STANDARD LAP WELDED BOILER TUBES.



Plate 353.

Outside Diameter, per Inches.	Price per foot.	Thickness			Outside Diameter, per Inches.	Price per Foot.	Thickness		
		Thick- ness, Inches.	nearest Bmg. W. G.	Nominal Weight per foot.			Thick- ness, Inches.	nearest Bmg. W. G.	Nominal Weight per foot.
1	\$0 37	.095	13	.90	4½	\$0 69	.134	10	6.17
1¼	35	.095	13	1.15	5	82	.148	9	7.58
1½	32	.095	13	1.40	6	1 08	.165	8	10.16
1¾	32	.095	13	1.66	7	1 33	.165	8	11.90
2	30	.095	13	1.91	8	1 70	.165	8	13.65
2¼	32	.095	13	2.16	9	2 25	.180	7	16.76
2½	36	.109	12	2.75	10	2 76	.203	6	21.00
2¾	39	.109	12	3.04	11	3 30	.220	5	25.00
3	39	.109	12	3.33	12	3 77	.229	4½	28.50
3¼	45	.120	11	3.96	13	4 43	.236	4	32.06
3½	48	.120	11	4.28	14	5 04	.248	3½	36.00
3¾	55	.120	11	4.60	15	5 87	.259	3	40.60
4	60	.134	10	5.47	16	6 50	.270	2½	45.20

The above prices are for Tubes up to 20 feet long—for tubes in excess of that length, 10 per cent will be added to net of invoice. Extra thickness of Tubes will be charged as per list of Extra Gauges.

Order by outside diameter.

EXTRA WIRE GAUGES.

For extra Wire Gauge Boiler Tubes, away from Standard, not exceeding four Wire Gauges, add 1½ cents for each inch in diameter to the list price per foot for each additional number.

To calculate price, take discounts from list prices of regular Tubes and add net charge for extra Wire Gauge.

For One Number.	For Two Numbers.	For Three Numbers.	For Four Numbers.
2 inch . . . \$0 02	2 inch . . . \$0 04	2 inch . . . \$0 06	2 inch . . . \$0 08
2¼ inch . . . 02¼	2¼ inch . . . 04½	2¼ inch . . . 06¾	2¼ inch . . . 09
2½ inch . . . 02½	2½ inch . . . 05	2½ inch . . . 07½	2½ inch . . . 10

SAFE ENDS.

Over 6 inches long, the extra length will be charged for in same proportion.

Size, inches	1	1¼	1½	1¾	2	2¼	2½	2¾
Each End, net	\$0 13	13	13	13	13	14	16	18
Size, inches	3	3¼	3½	3¾	4	4½	5	6
Each End, net	\$0 20	22	25	27	29	32	37	45

BOILER TUBE CIPHER.

FOR ORDERING BY TELEGRAPH.



Number of Tubes Required.				Diameter of Tubes, O. D., Inches	Length in feet of Tubes, Feet	Length in inches of Tubes, Inches	Wire Gauge. Use only when the required thickness differs from Standard
1 Mab	31 Mean	61 Mizzen	91 Mullet	1 Albatros	1 Ape	1 Alewife	1 Apollo
2 Mac	32 Meat	62 Moat	92 Mull	1¼ Bittern	2 Badger	2 Bass	2 Bacchus
3 Mad	33 Melt	63 Mob	93 Mump	1½ Condor	3 Cat	3 Cod	3 Cupid
4 Mag	34 Mend	64 Mock	94 Mural	1¾ Duck	4 Dog	4 Dolphin	4 Diana
5 Mail	35 Mense	65 Mode	95 Muse	2 Eagle	5 Elk	5 Eel	5 Erebus
6 Maid	36 Ment	66 Moil	96 Mush	2¼ Finch	6 Fox	6 Flounder	6 Flora
7 Main	37 Mere	67 Moist	97 Musk	2½ Goose	7 Goat	7 Grampus	7 Graces
8 Make	38 Merl	68 Mold	98 Mute	2¾ Hawk	8 Horse	8 Hake	8 Hebe
9 Man	39 Mesh	69 Mole	99 Mystic	3 Ibis	9 Ibex	9 Lobster	9 Iris
10 Manks	40 Met	70 Monde	100 Mrytle	3¼ Jay	10 Jackal	10 Mullet	10 Jupiter
11 Manor	41 Mew	71 Monk	150 Nab	3½ Kite	11 Kangaroo	11 Nautilus	11 Luna
12 Many	42 Mice	72 Mont	200 Nice	3¾ Lark	12 Lion	12 Oyster	12 Mercury
13 Mar	43 Mid	73 Mop	250 Nut	4 Macaw	13 Mule		13 Neptune
14 March	44 Midge	74 Moral	300 Obey	4½ Nightingale	14 Nylgau		14 Orpheus
15 Mars	45 Midat	75 More	350 Old	5 Owl	15 Otter		1½ Pan
16 Marks	46 Might	76 Morn	400 Pad	6 Plover	16 Panther	Length in fractions of Inches.	¼ Saturn
17 Marl	47 Mild	77 Morris	450 Pin	7 Parrot	17 Quagga		¾ Uranus
18 Marsh	48 Mile	78 Morse	500 Quad	8 Quail	18 Ram	⅛ Dew	
19 Mart	49 Milk	79 Most	550 Quote.	9 Robin	19 Sheep	¼ Hail	
20 Mask	50 Mince	80 Mot	600 Rapid	10 Raven	20 Tiger	⅜ Ice	
21 Mast	51 Mingle	81 Moth	650 Row	11 Starling	21 Unicorn	½ Rain	
22 Mat	52 Mind	82 Mould	700 Sad	12 Teal	22 Vampire	⅝ Snow	
23 Match	53 Minor	83 Mount	750 Scot	13 Vulture	23 Wolf	¾ Sleet	
24 Math	54 Mint	84 Mouth	800 Tap	14 Widgeon	24 Zebra	⅞ Water	
25 Mate	55 Mire	85 Move	850 Try	15 Wren			
26 Maul	56 Mirk	86 Mow	900 Ugly				
27 May	57 Mirth	87 Much	950 Urn				
28 Maze	58 Miss	88 Mud	1000 Vast				
29 Mead	59 Mite	89 Mite					
30 Meal	60 Mix	90 Mufti					

EXAMPLES.**TELEGRAPHIC MESSAGE FOR BOILER TUBES.**

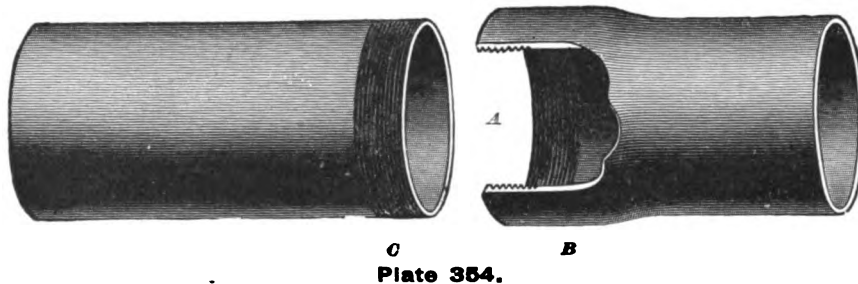
"At what price, and how soon, can you furnish two hundred and thirty-eight Boiler Tubes, three and three-quarter inches diameter, seventeen feet and seven-eighths inches long, number ten Gauge?"

Transposed into the above Telegraphic Cipher, it will read :

Baro, Nice, Merl, Lark, Quagga, Grampus, Water, Jupiter.

ARTESIAN, SALT AND OIL WELL CASINGS.

INSERTED JOINT CASING.

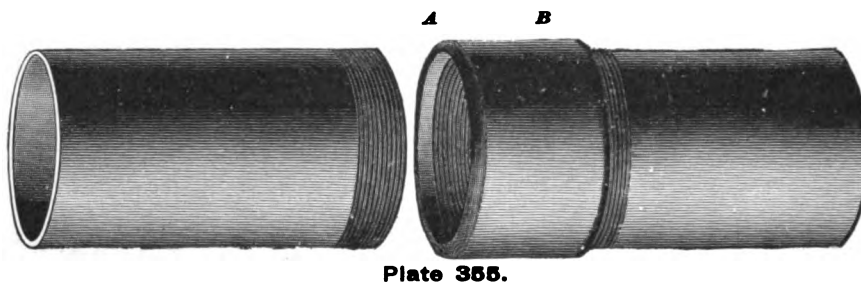


A.—Broken section, showing Female thread.

B.—Swelled or bell end of Inserted Joint Casing.

C.—Male thread.

SCREW AND SOCKET CASING.



A.—Reinforcing Recess in Socket, preventing strain on thread.

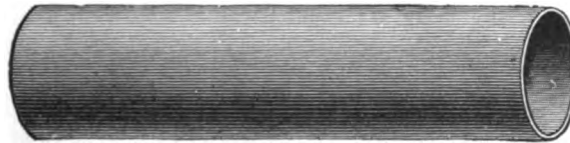
B.—Socket.

LAP-WELDED CASINGS.

Nominal Inside Diam. Inches.	Actual Outside Diam. Inches.	Price Per Foot.	Nominal Weight per ft. Pounds.	No. of Threads per inch of Screw.	Nominal Inside Diam. Inches.	Actual Outside Diam. Inches.	Price Per Foot.	Nominal Weight per ft. Pounds.	No. of Threads per inch of Screw.
2	2 1/4	\$0.24	2.22	14	5 5/8	6	\$0.95	14.20	11 1/2
2 1/4	2 1/2	.26	2.82	14	5 5/8	6	1.13	16.70	11 1/2
2 1/2	2 3/4	.27	3.13	14	6 1/4	6 5/8	.85	11.58	14
2 3/4	3	.29	3.45	14	6 1/4	6 5/8	.97	13.32	11 1/2 & 14
3	3 1/4	.32	4.10	14	6 1/4	6 5/8	1.18	17.02	11 1/2
3 1/4	3 1/2	.35	4.45	14	6 3/8	7	.93	12.34	14
3 1/2	3 3/4	.37	4.78	14	6 3/8	7	1.27	17.51	10 & 11 1/2
3 3/4	4	.43	5.56	14	7 1/4	7 3/8	1.06	13.55	14
4	4 1/4	.46	6.00	14	7 3/8	8	1.22	15.41	11 1/2
4 1/4	4 1/2	.50	6.36	14	7 3/8	8	1.53	20.17	11 1/2
4 1/2	4 3/4	.67	9.38	14	8 1/4	8 3/8	1.25	16.07	11 1/2
4 1/2	4 3/4	.52	6.73	14	8 1/4	8 3/8	1.56	20.10	11 1/2
4 3/4	5	.67	9.39	14	8 1/4	8 3/8	1.86	24.38	8 & 11 1/2
5	5 1/4	.58	7.80	14	8 3/8	9	1.51	17.60	11 1/2
5	5 1/4	.61	8.20	14	9 3/8	10	1.80	21.90	11 1/2
5	5 1/4	.71	9.86	14	10 3/8	11	2.13	26.72	11 1/2
5	5 1/4	.87	12.80	11 1/2	11 3/8	12	2.42	30.35	11 1/2
5	5 1/4	1.06	15.88	11 1/2	12 1/8	13	2.95	33.78	11 1/2
5 1/8	5 1/2	.63	8.62	14	13 1/8	14	3.48	42.02	11 1/2
5 1/8	5 1/2	.84	12.49	11 1/2	14 1/8	15	4.15	47.66	11 1/2
5 3/8	6	.73	10.46	14	15 1/8	16	4.57	51.47	11 1/2
5 3/8	6	.83	12.04	11 1/2					

BRAZED BRASS TUBING.**BROWN & SHARPE'S GAUGE THE STANDARD.**

Prices are for 100 pounds or more of Brazed Brass Tubing in one order.

**Plate 356.**

Plain Round Tube, $\frac{3}{4}$ inch up to 2 inch, to No. 19, inclusive, per pound	\$0 35
Plain Round Tube, $\frac{5}{8}$ inch up to $\frac{3}{4}$ inch, to No. 19, inclusive, per pound	36
Plain Round Tube, $\frac{1}{2}$ inch up to $\frac{5}{8}$ inch, to No. 19, inclusive, per pound	38
Plain Round Tube, $\frac{3}{8}$ inch up to $\frac{1}{2}$ inch, to No. 19, inclusive, per pound	41
Plain Round Tube, $\frac{1}{4}$ inch up to $\frac{3}{8}$ inch, to No. 19, inclusive, per pound	48
Plain Round Tube, $\frac{1}{8}$ inch up to $\frac{1}{4}$ inch, to No. 19, inclusive, per pound	65
Plain Round Tube, $\frac{3}{16}$ inch up to $\frac{1}{8}$ inch, to No. 19, inclusive, per pound	1 00
Plain Round Tube, $\frac{1}{16}$ inch up to $\frac{3}{16}$ inch, to No. 19, inclusive, per pound	1 50
Smaller than $\frac{1}{16}$ inch, special; 3 inch and larger, special.	
2 inch to 3 inch, to No. 19, inclusive	38

Bronze and Copper, advance on Brass List, 3 cents.

For No. 20, add	2 cents extra.
For No. 21, add	4 cents extra.
For No. 22, add	6 cents extra.
For No. 23, add	8 cents extra.
For No. 24, add	12 cents extra.
For No. 25, add	16 cents extra.
For No. 26, add	20 cents extra.
Thinner than No. 26, Special.	

All Mandrel-drawn Tubes, $\frac{3}{8}$ inch and over, advance on above	\$0 05
All Mandrel-drawn Tubes, under $\frac{3}{8}$ inch, advance on above	25
Square and Fancy Tubes, advance on above	8
Extra Fancy Patterns, advance on above	16

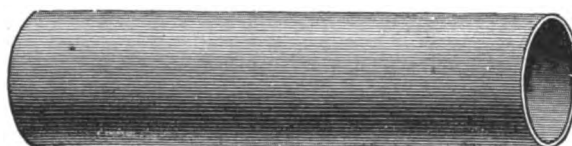
Open Seam Tubes, 4 cents less than above prices of corresponding diameter and thickness.

Tubing cut	12 in. to 24 in.	6 in. to 12 in.	4 in. to 6 in.	2 in. to 4 in.	1 in. to 2 in.
Per pound	1c.	2c.	3c.	4c.	6c.

Shorter than 1 inch, Special.

BRASS PIPE.

IRON PIPE SIZE.

**Plate 357.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Outside Diameter . .	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$
Weight, per foot . . .	.30	.43	.58	.80	1.17	1.67	2.42	2.92	4.17	5	8	10	12
Price, per pound . . .	\$0 70	60	50	50	40	40	40	40	40	40	40	40	40

12-Foot Lengths kept in stock. Special Lengths made to order.

SEAMLESS DRAWN BRASS PIPE.

FOR PLUMBING

Size, Outside Diameter	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
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The above tubes are made in 11-foot lengths, with coupling on one end. Tinned if required.

Prices on application.

BRASS FITTINGS.



Plate 358.

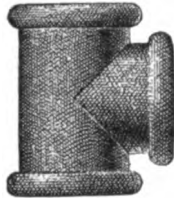


Plate 359.

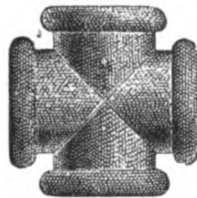


Plate 360.

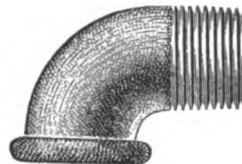


Plate 361.

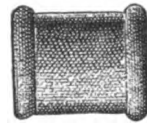


Plate 362.

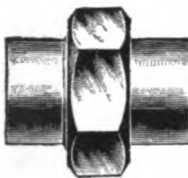


Plate 363.



Plate 364.



Plate 365.



Plate 366.



Plate 367.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Elbows, Rough, each	\$0 12	17	21	28	35	50	85	1 10	1 50	3 50	4 50	7 00	10 00
Reducing Elbows, Rough, each . . . . .	.....	22	26	35	45	62	1 10	1 40	1 90	4 40	5 65	8 75	12 50
Tees, Rough, each	15	20	30	40	50	75	1 00	1 30	1 75	4 00	5 50	9 00	13 00
Reducing Tees, Rough, each . . . . .	.....	25	38	50	63	95	1 25	1 65	2 20	5 00	6 90	11 25	16 25
Crosses, Rough, each . . . . .	.....	30	40	50	60	80	1 50	2 00	3 50	5 00	7 00	10 00	14 50
Reducing Crosses, Rough, each . . . . .	.....	38	50	65	75	1 00	1 90	2 50	4 40	6 25	8 75	12 50	18 00
Reducing Couplings, Rough, each . . . . .	.....	16	22	32	45	65	90	1 12	1 85	3 00	4 50	.....	.....
Plugs, Rough, each	09	10	12	15	20	28	40	50	90	1 25	2 00	3 00	4 00
Caps, Rough, each	15	15	20	25	35	45	60	80	1 10	2 00	3 00	.....	.....
Locknuts, Rough, each . . . . .	.....	10	12	15	20	30	45	70	95	1 50	2 75	.....	.....
Bushings, Rough, each . . . . .	.....	10	12	14	21	38	50	67	1 00	1 50	2 50	.....	.....
Street Elbows, Rough, each . . . . .	.....	.....	.....	55	75	1 00	1 80	.....	.....	.....	.....	.....	.....
Couplings, Rough, each	10	14	16	25	37	50	60	90	1 35	2 40	3 50	.....	.....
Couplings, R. and L., Rough, each . . . . .	.....	17	20	30	45	60	75	1 12	1 75	.....	.....	.....	.....
Ground Joint Unions, Rough, each	35	40	55	75	1 00	1 40	1 90	2 75	4 00	6 50	8 50	.....	.....
Close Nipples, each	12	15	20	25	30	40	60	90	1 25	2 50	3 50	.....	.....
Long Nipples, each	15	20	30	35	45	60	90	1 25	1 60	3 00	4 50	.....	.....
Elbows, Finished, each	24	34	42	56	70	1 00	1 70	2 20	3 00	7 00	9 00	14 00	20 00
Reducing Elbows, Finished, each . . . . .	.....	44	52	70	90	1 25	2 20	2 80	3 80	8 80	11 30	17 50	25 00
Tees, Finished, each	30	40	60	80	1 00	1 50	2 00	2 60	3 50	8 00	11 00	18 00	26 00
Reducing Tees, Finished, each . . . . .	.....	50	76	1 00	1 25	1 90	2 50	3 30	4 40	10 00	13 80	22 50	32 50
Crosses, Finished, each . . . . .	.....	60	80	1 00	1 20	1 60	3 00	4 00	7 00	10 00	14 00	20 00	29 00
Reducing Crosses, Finished, each . . . . .	.....	75	1 00	1 30	1 50	2 00	3 80	5 00	8 80	12 50	17 50	25 00	36 00
Reducing Couplings, Finished, each . . . . .	.....	32	44	64	90	1 30	1 80	2 25	3 70	6 00	9 00	.....	.....
Plugs, Finished, each	18	20	24	30	40	56	80	1 00	1 80	2 50	4 00	6 00	8 00
Caps, Finished, each	30	30	40	50	70	90	1 20	1 60	2 20	4 00	6 00	.....	.....
Locknuts, Finished, each . . . . .	.....	20	24	30	40	60	90	1 40	1 90	3 00	5 50	.....	.....
Bushings, Finished, each . . . . .	.....	20	24	28	42	76	1 00	1 35	2 00	3 00	5 00	.....	.....
Street Elbows, Finished, each . . . . .	.....	.....	.....	83	1 10	1 50	2 65	.....	.....	.....	.....	.....	.....
Couplings, Finished, each	20	28	32	50	75	1 00	1 20	1 80	2 70	4 80	7 00	.....	.....
Couplings, R. and L., Finished, each . . . . .	.....	31	36	55	82	1 10	1 35	2 00	3 10	.....	.....	.....	.....
Ground Joint Unions, Finished, each	32	36	50	70	90	1 25	1 70	2 50	3 60	6 00	7 75	.....	.....

MALLEABLE IRON, GAS, WATER AND STEAM FITTINGS.

REVISED LIST ADOPTED BY MANUFACTURERS JUNE 19, 1895.

CLASS A.

	Per lb.		Per lb.
Elbows, $\frac{1}{8}$, $\frac{1}{4}$ x $\frac{1}{8}$, $\frac{3}{8}$ x $\frac{1}{8}$,	\$0 30	Couplings, R. H., $\frac{1}{8}$ in	30
Tees, $\frac{1}{8}$, $\frac{1}{8}$ x $\frac{1}{4}$, $\frac{1}{4}$ x $\frac{1}{8}$, $\frac{3}{8}$ x $\frac{1}{8}$,	30	Ells, R. and L., $\frac{1}{4}$, $\frac{3}{8}$ in	30
R. and L. Couplings, $\frac{1}{8}$ in	30	R. and L. Return Bends, $\frac{3}{8}$, $\frac{1}{2}$ in	30

CLASS B.

	Per lb.		Per lb.
Elbows, $\frac{3}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ x $\frac{1}{4}$, $\frac{1}{2}$ x $\frac{1}{4}$ in	\$0 20	Lock Nuts, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in	20
Tees, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{4}$ x $\frac{3}{8}$, $\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{1}{4}$, $\frac{3}{8}$ x $\frac{1}{4}$, $\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{3}{8}$,	20	Extension Pieces, $\frac{3}{8}$ and $\frac{1}{2}$ in	20
Elbows, Side Outlets, $\frac{1}{2}$ in. and smaller	20	R. and L. Couplings, $\frac{1}{4}$, $\frac{3}{8}$ in	20
Tees, Side Outlets, $\frac{1}{2}$ in. and smaller	20	R. Hand Couplings, $\frac{1}{4}$, $\frac{3}{8}$ in	20
Street Ells, $\frac{1}{4}$, $\frac{3}{8}$ in	20	R. and L. Elbows, $\frac{1}{2}$ in	20
Crosses, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in	20	Waste Nuts, $\frac{3}{4}$ and smaller	20
Reducing Crosses, 1 in. and smaller	20	Chandelier Hooks, all sizes	20
Drop Ells and Tees, $\frac{1}{2}$ in. and smaller	20	Return Bends, $\frac{3}{8}$ and $\frac{1}{2}$ in	20
Caps, $\frac{1}{4}$, $\frac{3}{8}$ in	20	Return Bends, R. and L. $\frac{3}{4}$, 1 in	20
Reducing Couplings, $\frac{3}{8}$ x $\frac{1}{4}$ to $\frac{3}{4}$ x $\frac{3}{8}$, in- clusive	20	Wall Plates, all sizes	20
		45° Ells, $\frac{1}{2}$ in. and smaller	20
		Y's $\frac{1}{2}$, $\frac{3}{4}$ in	20

CLASS C.

	Per lb.		Per lb.
Elbows, $\frac{1}{2}$ and $\frac{1}{2}$ x $\frac{3}{8}$,	\$0 16	Reducing Couplings, $\frac{3}{4}$ x $\frac{1}{2}$ to 1 in., inclu- sive	\$0 16
Elbows, R. and L., $\frac{3}{4}$, 1 in.	16	R. and L. Couplings, $\frac{1}{2}$, $\frac{3}{4}$ in	16
Tees, $\frac{1}{2}$ and $\frac{1}{2}$ in., reducing	16	R. H. Couplings, $\frac{1}{2}$, $\frac{3}{4}$ in	16
Elbows, Side Outlets, $\frac{3}{4}$ in. and larger	16	Extension Pieces, $\frac{3}{4}$ in. and larger	16
Tees, Side Outlets, $\frac{3}{4}$ in. and larger	16	Waste Nuts, 1 in. and larger	16
Street Ells, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{4}$ x $\frac{1}{2}$, 1 x $\frac{3}{4}$ in	16	Return Bends, $\frac{3}{4}$, 1 in	16
Crosses, 1 and $\frac{3}{4}$ in., straight	16	45° Ells, $\frac{3}{4}$ to 2 in., inclusive	16
Drop Ells, $\frac{3}{4}$ and larger	16	Y's, 1 in. and larger	16
Drop Tees, $\frac{3}{4}$ and larger	16	Return Bends, R. and L., $1\frac{1}{4}$ in. and larger	16
Caps, $\frac{1}{2}$, $\frac{3}{4}$ and 1 in	16		
Lock Nuts, $\frac{3}{4}$, 1, $1\frac{1}{4}$ in	16		

CLASS D.

	Per lb.		Per lb.
Elbows and Tees, $\frac{3}{4}$ and 1 in.	\$0 13	Reducing Couplings, $1\frac{1}{4}$ in. and larger	\$0 13
Crosses, $1\frac{1}{4}$ in. and larger	13	R. H. Couplings, 1 in. and $1\frac{1}{4}$ in	13
Street Ells, 1 in. and larger	13	Return Bends, $1\frac{1}{4}$ in. and larger	13
Caps, $1\frac{1}{4}$ in. and larger	13	R. and L. Couplings, 1 in. and larger	13
Lock Nuts, $1\frac{1}{2}$ in. and larger	13	45° Elbow, $2\frac{1}{2}$ in. and larger	13
Such Fittings as have smaller outlets than $\frac{3}{4}$ in. will be classed "C."			

CLASS E.

	Per lb.		Per lb.
Elbows and Tees, $1\frac{1}{4}$ in. and larger	\$0 11	Right Hand Couplings, $1\frac{1}{2}$, 2 in	\$0 11
Such Fittings in this class that have outlets smaller than 1 in. to be classed "D."			

The run of Tees, (Bullheads,) gives the size for the purpose of classification, and the outlet being larger does not change it.

Return Bends, reduced, Return Bends, spread, Elbows, tapped on pitch, 15 per cent added.

	Class A	Class B	Class C	Class D	Class E
Black, per pound	\$0 30	20	16	13	11
Galvanized, per pound	40	27	23	20	18

ELBOW. MALLEABLE IRON.



Plate 368.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Price, Right Hand, each . . .	\$0 04	04	05	06	10	16	23	34	52	80	1 50	2 00	3 00
Price, Right and Left, each . .	...	05	06	08	12	20	28	40	65	...	...	...	...
Price, Galvanized, each . . . .	...	05	07	10	16	25	40	60	90	1 35	2 60	3 50	5 20

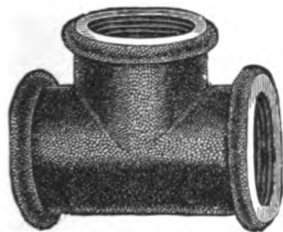


Plate 369.

TEE. MALLEABLE IRON.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$ in.
Price, each	\$0 07	07	08	09	13	19	27
Price, Galvanized, each . . . . .	.....	...	09	14	20	30	50
Size	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.	
Price, each	\$0 40	60	1 05	1 70	2 40	3 40	
Price, Galvanized, each	0 70	1 20	1 75	3 00	4 15	5 85	

CROSS. MALLEABLE IRON.



Plate 370.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Price, each	\$0 08	10	12	18	26	36	55	85	1 75	2 75	3 25	4 00
Price, Galvanized, each, .....	...	16	25	40	60	90	1 45	...	...	...	...	...

SIDE OUTLET ELBOW. MALLEABLE IRON.



Plate 371.

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Price, each	\$0 10	10	15	20	35	50

REDUCER.

MALLEABLE IRON.

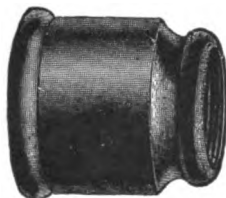


Plate 372.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Price, each	\$0 03	03	05	10	16	20	28	45	70	1 00	1 50	1 85
Price, Galvanized, each		04	06	15	25	35	45	75	1 05	1 65	2 40	3 05



Plate 373.

DROP TEE.

MALLEABLE IRON.

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1 in.
Price, each	\$0 08	12	20	30

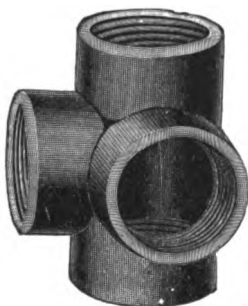


Plate 374.

FOUR-WAY TEE.

MALLEABLE IRON.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Price, each	\$0 25	30	35	45	70

RETURN BENDS.

MALLEABLE IRON

CLOSE PATTERN.

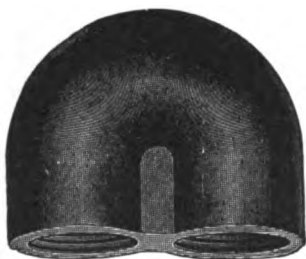


Plate 375.

OPEN PATTERN.

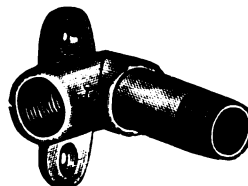
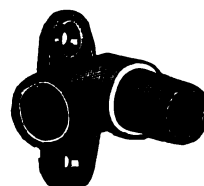


Plate 376.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Close Pattern, distance between centers .	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$ in.	.....	.....
Close Pattern, R. H., each	\$0 13	20	30	45	65	1 00	.....	.....
Close Pattern, R. & L., each	14	25	38	55	80	1 25	.....	.....
Close Pattern, R. H., Galvanized, each .	25	35	45	70	1 05	1 65	.....	.....
Open Pattern, distance between centers .	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5 in.
Open Pattern, R. H., each	\$0 15	25	35	55	75	1 25	2 00	3 00
Open Pattern, R. & L., each	18	30	43	70	95	1 60	2 50	3 75

DROP ELBOWS.

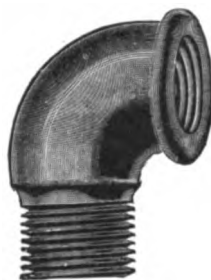
FEMALE. FLANGE RIGHT SIDE. FLANGE LEFT SIDE. WITH LONG OUTLET PIECE. MALE AND FEMALE.

**Plate 377.****Plate 378.****Plate 379.****Plate 380.****Plate 381.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$ in.
Price, either Pattern	\$0 06	08	12	20

STREET ELBOW.

MALLEABLE IRON.

**Plate 382.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price, each	\$0 10	10	15	25	35	50	75
Price, Galvanized, each	12	15	25	35	55	80	1 20

CAP.

MALLEABLE IRON.

**Plate 383.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Price, each	\$0 03	04	05	08	12	16	24	32	45	70	85	1 20
Price, Galvanized, each	04	05	08	12	16	24	38	52	76	1 15	1 40	2 00

BUSHINGS.

MALLEABLE IRON.

**Plate 384.**

FACED.

**Plate 385.**

REDUCING ONE SIZE ONLY.

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Price, each	\$0 04	04	05	06	07	09	14	21
Price, Galvanized, each	08	08	10	12	14	18	28	42
Price, Faced, each	08	09	11	13	17	22	32	48

R. AND L. NIPPLES WITH HEXAGON CENTER.

MALLEABLE IRON.

**Plate 386.**

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Each	\$0 25	30	40	50	70

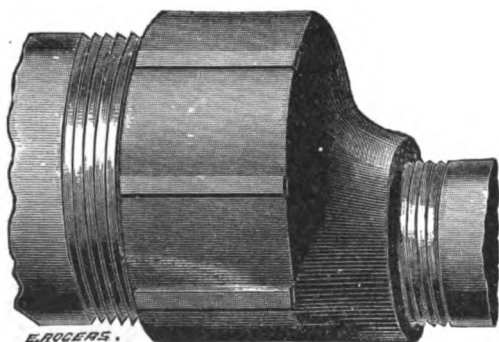
OFFSET REDUCING COUPLINGS.

MALLEABLE IRON.

**Plate 387.**

This fitting is the same as a Male and Female Reducer, except that the Inlet and Outlet are on the same level. By its use, water pockets are prevented.

Size	$1 \times \frac{3}{4}$	$1\frac{1}{4} \times 1$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2 \times 1\frac{1}{2}$	$2\frac{1}{2} \times 2$	$3 \times 2\frac{1}{2}$	$3\frac{1}{2} \times 3$	4×3	5×4 in.
Each	\$0 30	35	45	55	90	1 25	1 75	2 25	3 00

**Plate 388.****ECCENTRIC REDUCERS.**

We wish to call special attention to our Eccentric Reducer. A glance will show the advantage of it over the ordinary reducing socket. It brings the bottoms of the connected pipes to the same level, thus avoiding a trap where water collects, which condenses the steam passing over it, the snapping and cracking so frequently heard in steam heating pipes, the use of expensive relief pipes to carry off this water, and the use of hangers of different lengths.

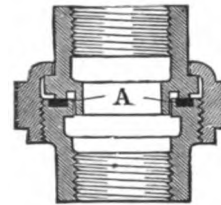
Size of Pipe	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8 in.
Eccentric Reducers	\$0 25	36	50	75	1 20	1 50	2 00	3 00	4 00	10 00

SIZE INCHES.

$1\frac{1}{4} \times 1$	$2\frac{1}{2} \times \frac{3}{4}$	$3 \times 2\frac{1}{2}$	$3\frac{1}{2} \times 1\frac{1}{2}$	$4 \times 1\frac{1}{2}$	$5 \times 1\frac{1}{2}$	7×4
$1\frac{1}{2} \times 1$	$2 \times 1\frac{1}{2}$	3×2	$3\frac{1}{2} \times 1\frac{1}{4}$	$4 \times 1\frac{1}{4}$	$5 \times 1\frac{1}{4}$	7×5
$1 \times \frac{1}{2}$	$2 \times 1\frac{1}{4}$	$3 \times 1\frac{1}{2}$	$3\frac{1}{2} \times 1$	4×1	6×5	$7 \times 3\frac{1}{2}$
$1 \times \frac{3}{4}$	2×1	$3 \times 1\frac{1}{4}$	$4 \times 3\frac{1}{2}$	$5 \times 3\frac{1}{2}$	6×4	7×3
$1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 2$	3×1	4×3	5×4	$6 \times 3\frac{1}{2}$	8×6
$1\frac{1}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 1\frac{1}{2}$	$3\frac{1}{2} \times 3$	$4 \times 2\frac{1}{2}$	5×3	6×3	
$1\frac{1}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times 1\frac{1}{4}$	$3\frac{1}{2} \times 2\frac{1}{2}$	4×2	$5 \times 2\frac{1}{2}$	$6 \times 2\frac{1}{2}$	
$2 \times \frac{3}{4}$	$2\frac{1}{2} \times 1$	$3\frac{1}{2} \times 2$	$4\frac{1}{2} \times 3$	5×2	6×2	

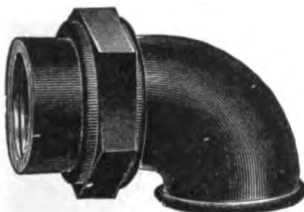
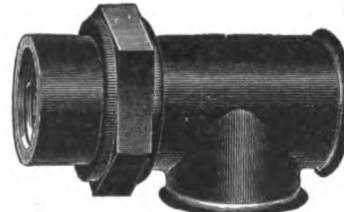
MALLEABLE IRON UNION.**Plate 389.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Plain, each . . .	\$0 18	18	20	22	27	33	46	58	75	1 55	2 10	3 65	4 35
Galvanized, each	27	27	30	33	40	50	70	90	1 15	2 35	3 15	5 50	6 50

AMERICAN UNIONS.**Plate 390.****Plate 391.**

The American Union is an extra heavy Malleable Iron Union, which requires no packing or preparation of any sort to make a perfect and permanent joint that will withstand the action of steam, water, gas, acids, oils, ammonia, natural gas, etc. The composition metal with which the joint is made being entirely non-corrosive, will last indefinitely, as it cannot burn, blow or rot out; while, if desired, the Union can be taken apart in a moment and as quickly put together.

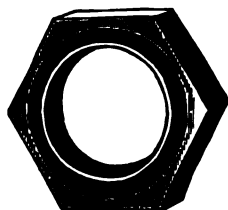
Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Plain, each	\$0 20	24	28	35	40	56	80	95	2 00	2 75
Galvanized, each	24	28	35	46	55	78	1 12	1 35	2 90	3 75

UNION ELBOWS AND TEES.**MALLEABLE IRON.****UNION ELBOW.****Plate 392.****UNION TEE.****Plate 393.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Union Elbows, each	\$0 42	54	63	90	1 05	1 55	2 85
Union Elbows, Galvanized, each	63	81	95	1 35	1 58	2 35	4 30
Union Tees, each	45	57	70	95	1 15	1 70	3 20
Union Tees, Galvanized, each	68	86	1 05	1 45	1 75	2 55	4 80

LOCK NUT.

MALLEABLE IRON.

**Plate 394.**

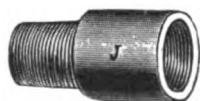
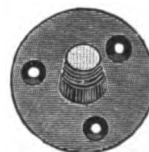
Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price, each	\$0 02	03	04	05	07	09	11	18
Price, Galvanized, each	03	04	05	07	10	14	20	30
Price, Faced, each	08	09	10	12	15	20	25	30

WASTE NUT.

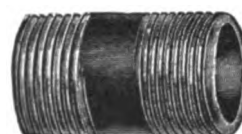
MALLEABLE IRON.

**Plate 395.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1 in.
Price, each	\$0 04	05	06	08	10

CHANDELIER HOOK.**EXTENSION PIECE.****Plate 396.****Plate 397.****WALL PLATE.****Plate 398.**

Size	$\frac{3}{8}$	$\frac{1}{2}$ in.
Price, Extension Pieces, each	\$0 05	.....
Price, Chandelier Hooks, each	10	12
Price, Wall Plates, each	10	.....

WROUGHT-IRON NIPPLES.**CLOSE.****Plate 399.****SHOULDER.****Plate 400.****PLAIN RIGHT HAND.**

LENGTH, INCHES			SIZE Inch	PRICES			PRICE OF EXTRA LONG NIPPLES, INCHES.									
Close	Short	Long		Close or Short	Long		4	5	6	7	8	9	10	11	12	
3/4	1 1/2	2	2 1/2	3	3 1/2	1/8	\$0 03	04	05	06	06	07	08	08	09	10
7/8	1 1/2	2	2 1/2	3	3 1/2	1/4	03	04	05	06	06	07	08	08	09	10
1	1 1/2	2	2 1/2	3	3 1/2	3/8	03	04	05	06	06	07	08	08	09	10
1 1/8	1 1/2	2	2 1/2	3	3 1/2	1/2	04	05	06	07	08	09	10	10	11	12
1 1/4	2	2 1/2	3	3 1/2	4	3/4	05	07	08	09	10	11	12	13	14	15
1 1/2	2	2 1/2	3	3 1/2	4	1	06	09	11	12	14	15	16	18	19	20
1 3/8	2 1/2	3	3 1/2	4	4 1/2	1 1/4	09	12	14	16	18	19	21	23	25	27
1 3/4	2 1/2	3	3 1/2	4	4 1/2	1 1/2	10	15	17	20	22	24	27	29	31	34
2	2 1/2	3	3 1/2	4	4 1/2	2	13	19	22	25	28	31	34	36	39	42
2 1/2	3	3 1/2	4	4 1/2	5	2 1/2	28	38	44	49	55	60	65	70	75	75
2 3/4	3	3 1/2	4	4 1/2	5	3	35	50	58	65	72	79	85	93	1 00	1 00
3	4	4 1/2	5	5 1/2	6	3 1/2	50	68	76	85	93	1 03	1 13	1 20	1 20	1 20
3 1/4	4	4 1/2	5	5 1/2	6	4	58	78	88	98	1 08	1 18	1 28	1 38	1 38	1 38
3 1/2	4	4 1/2	5	5 1/2	6	4 1/2	88	1 18	1 33	1 48	1 63	1 78	1 93	2 08	2 08	2 08
3 3/4	4 1/2	5	5 1/2	6	6 1/2	5	1 05	1 40	1 50	1 68	1 85	2 03	2 20	2 38	2 38	2 38
4	4 1/2	5	5 1/2	6	6 1/2	6	1 33	1 75	1 88	2 10	2 33	2 55	2 78	3 00	3 00	3 00
4 1/4	5	5 1/2	6	6 1/2	7	7	1 88	2 25	2 45	2 75	3 05	3 35	3 65	3 95	3 95	3 95
4 1/2	5	5 1/2	6	6 1/2	8	8	2 25	2 63	2 93	3 30	3 65	4 00	4 38	4 75	4 75	4 75
5	5 1/2	6	6 1/2	7	9	9	3 25	3 70	4 15	4 60	5 05	5 50	5 95	6 40	6 85	7 30
5 1/4	5 1/2	6	6 1/2	7	10	10	4 00	4 68	5 35	6 03	6 70	7 38	8 05	8 75	9 40	10 05
5 1/2	5 1/2	6	6 1/2	7	11	11	5 00	5 93	6 85	7 78	8 70	9 63	10 50	11 40	12 30	13 20
5 3/4	5 1/2	6	6 1/2	7	12	12	6 00	6 75	7 50	8 25	9 00	9 75	10 50	11 25	12 00	12 75

RIGHT AND LEFT.

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Close or Short	\$0 04	04	05	07	09	12	14	18	38	50	65	75
Long	06	06	07	09	11	16	19	24	50	65	85	1 00

GALVANIZED.

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Close or Short	\$0 04	04	05	06	09	13	15	20	38	50	73	80
Long	06	06	07	10	13	19	24	31	55	75	1 03	1 23

Nipples made to order from extra heavy pipe at double above list.

Sixty per cent to be added to the price of R. and L. Black Nipples for R. and L. Galvanized.

LONG SCREWS.**WITH COUPLING AND LOCK-NUT FACED.****Plate 401.**

Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3 in.
Standard Length	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	7	8 in.
Standard Length, Black, each	\$0 30	35	40	55	75	1 00	1 30	1 70	2 70	3 70
Standard Length, Galvanized, each	35	40	50	66	1 00	1 25	1 60	2 10	3 10	4 70

Long Screws, longer than Standard, made to order and charged as Cut Pipe.

Threads, Couplings and Lock-Nuts, extra.

Long Screws made to order from extra heavy pipe.

FITTINGS FOR WROUGHT IRON PIPE.

COUPLINGS.

WROUGHT IRON.

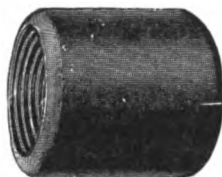


Plate 402.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Right Hand, plain, each	\$0 05	05	06	07	10	13	17	21	28	40	60
Right and Left, plain, each	07	07	08	11	15	20	25	30	50	85	1 20
Right Hand, Galvanized, each	06	06	08	10	13	18	25	32	40	55	80
Size	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.	
Right Hand, plain, each	\$0 80	1 00	1 50	1 65	2 40	3 25	4 25	5 50	7 50	10 00	
Right Hand, Galvanized, each	1 05	1 40	2 00	2 25	3 25	.....	.....	.....	.....	.....

MALLEABLE IRON COUPLINGS.

PLAIN.

RIGHT HAND.

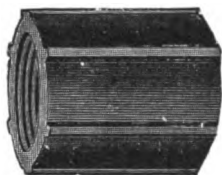


Plate 403.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price, plain, each	\$0 03	04	07	12	14	20	29	44
Price, Galvanized, each	05	07	10	17	23	30	40	55

RIBBED.

RIGHT AND LEFT.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price, plain, each	\$0 04	05	06	10	16	23	34	52
Price, Galvanized, each	05	07	10	15	25	35	50	75

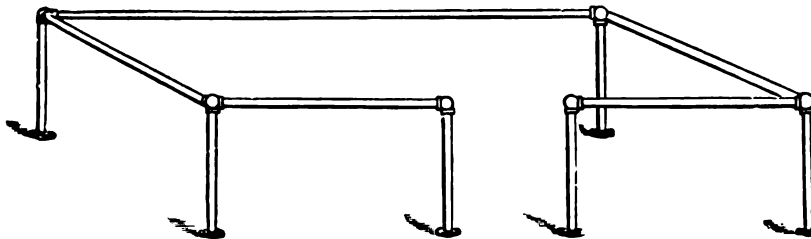
MALLEABLE IRON RAILING FITTINGS.

FOR FENCES, ENCLOSED ENGINES AND MACHINERY, EXHIBITION SPACES, ETC.

**Plate 404.****Plate 405.****Plate 406.****Plate 407.****Plate 408.****Plate 409.****Plate 410.****Plate 411.**

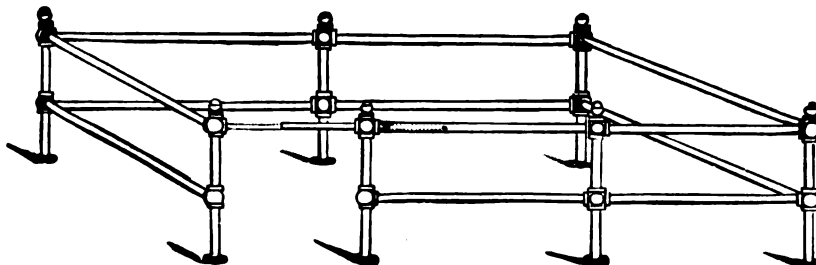
Pipe size	1	1 1/4	1 1/2	2 in.
Plate 404, Elbow	\$0 20	35	45	72
Plate 405, Elbow, Side Outlet	25	40	50	80
Plate 406, Tee	25	40	50	75
Plate 407, Tee, Side Outlet	35	45	55	90
Plate 408, Cross	35	45	58	1 00
Plate 409, Cross, Side Outlet	40	50	65	1 35
Plate 410, Floor Flange	15	20	28	30
Plate 411, Acorn Ornament	20	25	35	90

In ordering these Railing Fittings be careful to state whether right or left hand threads are wanted. Where Fittings are required having right and left hand Outlets, please fully describe which are wanted right hand and which left hand. A careful observance of the above will save much trouble, and secure the accurate filling of your orders.

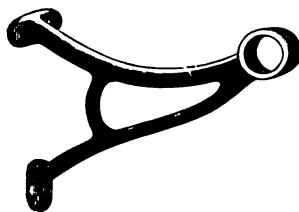
EXHIBITION RAILINGS.**Plate 412.**

To construct a Railing two pipes high, the upper outlet of all fittings used in lower pipe should be tapped with left hand thread, but when orders are sent us without specifying how outlets are to be tapped, all fittings will invariably be furnished right hand.

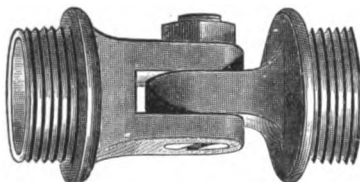
As the fittings do not need to be steam or water tight, a sufficiently clean thread to screw up well and make a good job can be made by running a left hand tap into any outlet tapped right hand.

**Plate 413.**

A neat and simple gate can be made by reducing with a bushing the outlets of the fittings on each side of the passage way, and then using a smaller size pipe to slide back and forward inside of the top rail, with a pin to prevent its running back too far. (See dotted line in lower cut.)

MALLEABLE IRON RAILING FITTINGS.**FOOT RAIL BRACKETS.****Plate 414.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price	\$0 40	50	70	80	.....	.....

HINGE FOR PIPE GATES.**Plate 415.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price	\$0 35	40	45	55	80	1 00

LATCH FOR PIPE GATES.**Plate 416.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price	\$0 25	30	35	40	45	50

STAIR HAND RAIL TEES.**Plate 417.**

Adjustable to any desired angle.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Price	\$.....	45	65	1 00	1 15	.....

THE GRIFFIN FOOT RAIL AND BRACKET.



Plate 418.

CORNER FITTING



Plate 419.

END FINISH.



Plate 420.

	Plain Iron	Bronzed Iron	Galvanized Iron	Artistic Brass
Brackets	\$0 50	85	85	3 50
Corner Fittings	50	75	75	3 00
End Finish Fittings	15	25	25	1 40

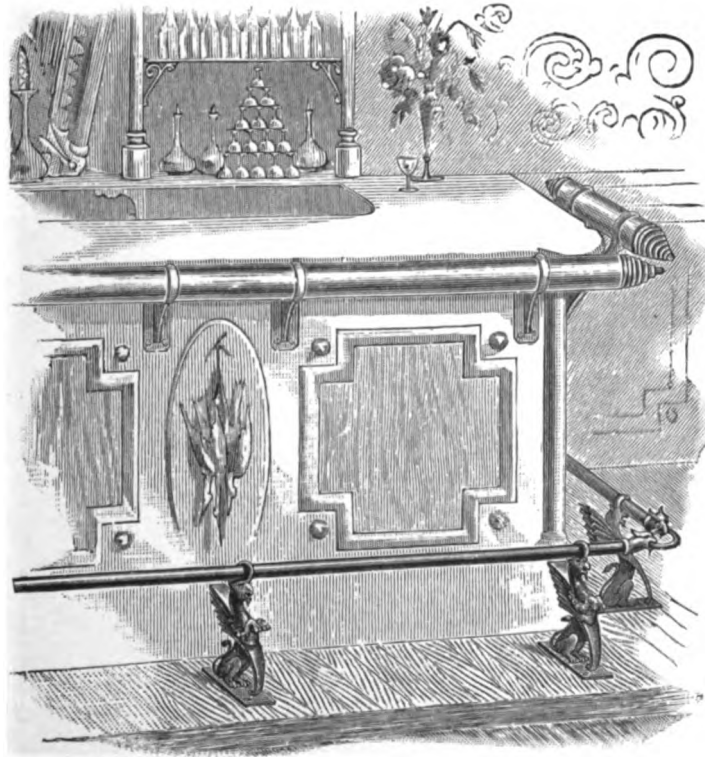
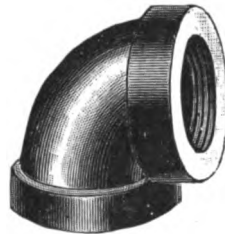


Plate 421.

It has been our aim in designing the Griffin Foot Rail Bracket, as illustrated herewith, to produce an article artistic in design, and fitted in form so as to bear the heaviest strain with the least possible chance of disarrangement, while at the same time it is a model of lightness.

CAST IRON FITTINGS.**ELBOW.**

CAST IRON.

**Plate 422.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Price, R. H., each	\$0 05	05	06	08	10 $\frac{1}{2}$	16	20	28	50	75
Price, R. and L.	06	06	07	09	12	18	23	32	60	85
Size	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.
Price, R. H., each	\$1 05	1 20	1 75	2 00	2 75	4 70	6 75	9 00	13 50	20 00

REDUCING ELBOW.

CAST IRON.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Price, each	\$0 07	09	12	18	23	32	60	85	1 20
Size	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.
Price, each	\$1 40	2 00	2 30	3 15	5 40	7 75	10 50	15 50	23 00

45° ELBOW.

CAST IRON.

**Plate 423.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Price, each	\$0 06	06	07	10	12	19	24	34	60	90
Size	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	10	12 in.	
Price, each	\$1 25	1 45	2 20	2 50	3 45	5 90	8 50	17 00	25 00	

Right and Left Elbows, not specified above, made to order and charged extra.

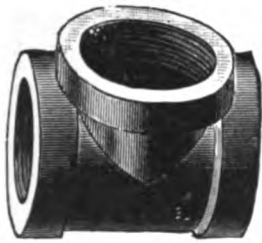


Plate 424.

TEE.**CAST IRON.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 08	08	09	12	15	23	29	41	73	1 10
Size	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.
Each	\$1 50	1 75	2 55	3 00	4 00	6 80	9 75	13 00	19 50	29 00

REDUCING TEE.**CAST IRON.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Each	\$0 09	10	14	17	27	33	47	83	1 25	1 75
Size	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.	.....
Each	\$2 00	2 95	3 50	4 60	7 80	11 25	15 00	22 50	33 50	.....

CROSS.**CAST IRON.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$ in.
Each	\$0 15	18	22	27	$\frac{42}{42}$
Size	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Each	\$0 53	75	1 30	2 00	2 70
Size	4	$4\frac{1}{2}$	5	6	7 in.
Each	\$3 15	4 60	5 50	7 25	12 25
Size	8	9	10	12 in.	.....
Each	\$17 50	23 50	35 00	52 50	.....



Plate 425.

REDUCING CROSS.**CAST IRON.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Each	\$0 18	25	30	46	60	83	1 45	2 20	3 00
Size	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.
Each	\$3 50	5 10	6 00	8 00	13 50	19 25	26 00	38 50	58 00



Plate 426.

PLUGS.**CAST IRON.**

Plate 427.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 02	02	02	03	04	05	07	10	18	25
Size	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.
Each	\$0 38	42	65	88	1 20	1 85	2 75	3 25	3 75	5 00
Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Galvanized, each . .	\$0 04	04	04	06	08	10	14	20	36	50
Countersunk, each . .	...	...	04	06	08	09	11	15	...	...
Solid, each	04	04	04	06	08	09	11	15	...	...

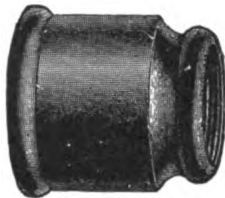
CAP.**CAST IRON.**

Plate 428.

Size	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.
Each	\$0 26	40	54	75	87	1 05	1 20	1 55	2 50	2 85	4 75	5 50	7 00

REDUCER.

CAST IRON.

**Plate 429.**

Size	2	2½	3	3½	4	4½	5	6	7	8	9	10	12 in.
Each	\$0 43	60	80	1 00	1 35	1 85	2 00	2 70	5 35	6 75	8 35	10 00	15 00

BUSHING.

CAST IRON.

REDUCING MORE THAN ONE SIZE.

**Plate 430.**

Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Each	\$0 04	04	05	06	07	09	14	21	30	40
Size	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in.	
Each	\$0 50	75	93	1 25	1 87	2 75	3 25	3 75	5 00	

LOCK NUT.

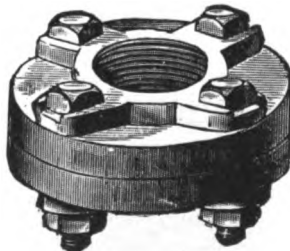
CAST IRON.

**Plate 431.**

Size	2	2½	3	3½	4	4½	5	6	7	8	9	10	12 in.
Each	\$0 25	27	34	47	64	85	90	1 30	1 70	2 35	2 70	3 00	4 00

FLANGE UNION.

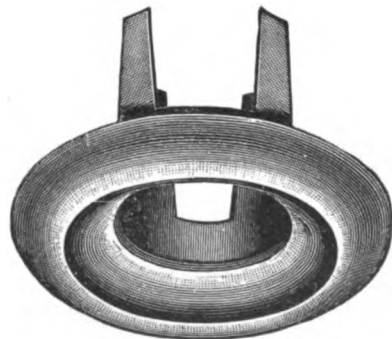
CAST IRON.

**Plate 432.**

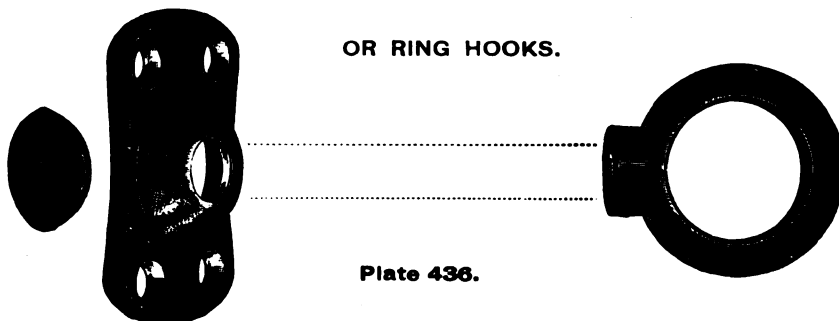
Size	½	¾	1	1¼	1½	2	2½	3	3½	4	4½ in.
Each	\$0 40	46	52	64	78	1 00	1 25	1 50	1 80	2 10	2 70
Size	5			6	7		8	9		10	12 in.
Each	\$3 15			3 95	5 50		7 00	10 00		11 50	16 00

CAST IRON FLANGES.**Plate 433.**

Size, inches.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	14
Diameter	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each
Flange	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each
3 in.	\$0 10	10																		
$3\frac{1}{2}$ in.	15	15	15	15	16															
4 in.	22	22	22	16	16															
$4\frac{1}{2}$ in.	25	25	25	25	25	22														
5 in.	35	35	30	30	30	30	35													
$5\frac{1}{2}$ in.	45	45	45	40	40	40	35	40												
6 in.	50	50	50	42	40	40	42	42	50											
$6\frac{1}{2}$ in.		65	60	60	60	55	50	50	50	65										
7 in.		75	75	75	70	70	62	62	62	75										
$7\frac{1}{2}$ in.		90	90	90	85	85	80	80	75	85	90									
8 in.	1 00	1 00	1 00	95	95	90	90	90	90	90	90									
$8\frac{1}{2}$ in.	1 25	1 25	1 25	1 15	1 15	1 10	1 10	1 10	1 00	1 00	1 00									
9 in.			1 35	1 35	1 35	1 30	1 25	1 15	1 15	1 15	1 15	1 15	1 40							
$9\frac{1}{2}$ in.				1 90	1 90	1 75	1 75	1 60	1 60	1 50	1 25	1 50	1 50							
10 in.				2 25	2 25	2 15	2 00	1 80	1 50	1 50	1 50	1 50	1 50							
11 in.						2 50	2 50	2 25	2 25	2 00	1 75	1 75	1 75	2 20						
12 in.							3 00	3 00	2 75	2 50	2 50	2 20	2 20	2 20	2 80					
13 in.								3 50	3 50	3 25	3 00	3 00	2 80	2 80	2 80					
14 in.								4 00	4 00	3 75	3 75	3 50	3 25	3 25	3 25	3 75	4 00			
15 in.														4 00	4 00	4 00	4 50			
16 in.														5 00	5 00	5 00	5 00	6 00		
17 in.														6 50	6 50	5 75	5 75	7 00		
18 in.															8 00	8 00	7 00	7 00		
19 in.																7 50	7 50			
20 in.																	8 50	8 50		
21 in.																		9 50		

BRASS FLOOR AND CEILING PLATES.**NICKEL-PLATED.****Plate 434.****Plate 435.**

For $\frac{3}{4}$ inch Pipe, per 100	\$10 00
For 1 inch Pipe, per 100	11 00
For $1\frac{1}{4}$ inch Pipe, per 100	12 00
For $1\frac{1}{2}$ inch Pipe, per 100	13 00
For 2 inch Pipe, per 100	15 00

EXPANSION PIPE HANGERS.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8 in.
Price, each . . .	\$0 17	18	19	25	29	36	44	55	63	1 12	1 35	1 80	2 25

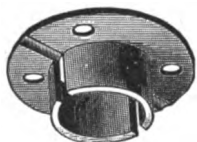
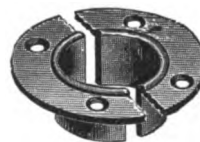
EUREKA PATENT ADJUSTABLE PIPE HANGERS.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8 in.
Price, each . . .	\$0 15	18	18	20	25	28	33	38	45	55	65	75	1 15	1 25

**CEILING PLATE.
FOR WROUGHT IRON PIPE.****Plate 437.**

This simple device enables the steam fitter to put up the pipe first then the plates afterward, thereby saving a great deal of labor and annoyance, as is the case in using the old style, which is made in one piece. Care is taken to insure a perfect fit, each piece being interchangeable.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Price, each	\$0 11	13	16	18	23	27	36	50	55	68

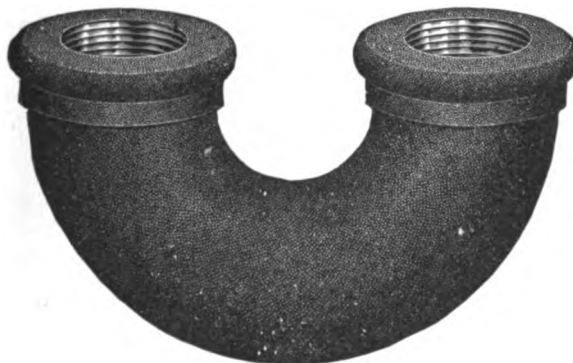
FLOOR PLATES.**Plate 438.****Plate 439.**

This Floor Plate is made with grooves on the under side of the flange, as shown in cut, in order that it may be easily parted by a slight blow when required to be used in halves.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Price, each	\$0 06	06	08	11	14	16	24	30

RETURN BENDS.

CAST IRON.



WIDE PATTERN.

Plate 440.

Size	1	1	1	1	1	1 1/4	1 1/4 in.
Center to Center	3	4	5	6	8	4	6 in.
Right Hand, Each	\$0 45	0 50	60	75	1 00	1 00	1 25
Galvanized, Each	80	90	1 10	1 30	1 60	1 75	2 00
Size	1 1/2	1 1/2	1 1/2	2	2	4	4 in.
Center to Center	4 7/8	6	8	4 7/8	6	7 1/2	11 in.
Right Hand, Each	\$1 30	1 60	2 00	1 75	2 00	5 75	6 50
Galvanized, Each	2 30	2 60	3 25	3 00	3 25	10 00	11 00

RETURN BENDS.

CAST IRON.

SPECIAL PATTERN.

Size	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2 in.	
Center to Center . . .	2 3/8	2 3/4	3	4	6	2 1/4	2 3/8	3	4	6	8	3 1/2	4 1/4	4 1/2 in.

Made to order only. Prices on application.

BACK-OUTLET RETURN BENDS.

Plate 441.

Size	3/4	1	1 1/4	1 1/2	2	2 1/2	3 in.
Center to Center	1 7/8	2 1/4	2 1/4	2 1/2	3 1/4	3 3/4	4 1/4
Right Hand, Each	\$0 38	42	60	80	1 15	2 00	3 00
Right Hand, Galvanized, Each	76	84	1 20	1 60	2 30	4 00	6 00

RETURN BENDS.

CAST IRON.

CLOSE PATTERN.



Plate 442.

OPEN PATTERN.



Plate 443.

CLOSE PATTERN.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Center to Center	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$ in.
Right Hand, Each	\$0 18	20	22	28	40	57	1 20	1 70
Right Hand, Galvanized, Each	36	40	44	56	80	1 14	2 40	3 40
Right and Left, Each	21	23	26	33	46	66	1 40	1 95

OPEN PATTERN.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Center to Center	$1\frac{1}{8}$	$2\frac{3}{8}$	3	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$ in.
Right Hand, Each	\$0 26	30	40	55	80	1 35	2 20
Right Hand, Galvanized, Each	52	60	80	1 10	1 60	2 70	4 40
Right and Left, Each	30	35	46	64	92	1 55	2 50

CLOSE PATTERN, PITCHED.

SUITABLE FOR COILS AS PER TABLE BELOW.

Size	1	1	1	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$ in.
Length of Pipe in Coil	3	4	5	6	8	4	5	6 ft.
Right Hand, Each	\$0 26	26	26	26	26	33	33	33

Y BRANCHES.

CAST IRON.



Plate 444.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 20	28	34	54	66	94	1 66	2 50
Reducing, Each	23	33	40	62	76	1 08	1 90	2 90
Galvanized, Each	40	56	68	1 08	1 32	1 88	3 32	5 00
Size	$3\frac{1}{2}$	4	5	6	7	8	10	12 in.
Each	\$3 50	4 00	7 00	9 20	15 60	22 50	45 00	67 00
Reducing, Each	4 00	4 60	8 00	10 60	18 00	26 00	51 75	77 00
Galvanized, Each	7 00	8 00	14 00	18 40	31 20	45 00	90 00	134 60

BRANCH TEES.

FOR BOX COILS.

No. 3.



Plate 445.

No. 4.



Plate 446.

No. 5.



Plate 447.

Branch Tees for Box Coils are always tapped left hand in branches and right hand in back inlet.
Inlet same size as branches unless otherwise ordered.

No. of Branches	Small pattern, Inside diameter $1\frac{3}{4}$ inches $2\frac{1}{2}$ inches, center to center No. 3		Large pattern, Inside diameter $2\frac{1}{4}$ inches $2\frac{1}{2}$ inches, center to center No. 4				Large pattern, Inside diameter $2\frac{1}{2}$ inches 3 inches, center to center No. 5			
	For 1-inch Pipe Inlets		For 1-inch Pipe Inlets.				For $1\frac{1}{4}$ -inch Pipe Inlets.			
	1 in.	$1\frac{1}{4}$ in.	1 in.	$1\frac{1}{4}$ in.	$1\frac{1}{2}$ in.	2 in.	$1\frac{1}{4}$ in.	$1\frac{1}{2}$ in.	2 in.	$2\frac{1}{2}$ in.
2	\$0 90	90	\$0 90	1 15	1 30	1 55	\$1 30	1 30	1 50	1 95
3	1 05	1 05	1 00	1 25	1 40	1 65	1 65	1 65	1 90	2 40
4	1 15	1 15	1 20	1 45	1 60	1 85	2 00	2 00	2 40	2 85
5	1 35	1 35	1 40	1 65	1 80	2 05	2 40	2 40	2 90	3 55
6	1 60	1 60	1 70	1 95	2 10	2 35	2 80	2 80	3 30	3 95
7	1 90	1 90	2 15	2 40	2 55	2 80	3 20	3 20	3 90	4 20
8	2 20	2 20	2 40	2 65	2 80	3 05	3 60	3 60	4 50	4 95
9	2 65	2 65	2 80	3 05	3 20	3 45	4 30	4 30	5 25	6 15
10	3 15	3 15	3 30	3 55	3 70	3 95	4 80	4 80	5 85	6 85
11	3 75	3 75	4 20	4 45	4 60	4 85	.....	.....	.....	.....
12	4 40	4 40	4 75	5 00	5 15	5 40	.....	.....	.....	.....
13 . . . .	.....	.....	5 50	5 75	5 90	6 15	.....	.....	.....	.....
14 . . . .	.....	.....	6 25	6 50	6 65	6 90	.....	.....	.....	.....
15 . . . .	.....	.....	7 00	7 75	7 40	7 65	.....	.....	.....	.....
16 . . . .	.....	.....	7 25	8 00	8 15	8 40	.....	.....	.....	.....

Always order by number.

Branch Tees not specified above made to order.

BRANCH TEES.

FOR CIRCULATION.

No. 1.

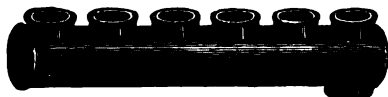


Plate 448.

No. 2.



Plate 449.

No. 6.

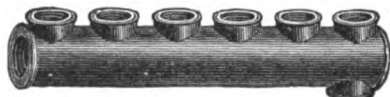


Plate 450.

No. 7.



Plate 451.

No. 8.

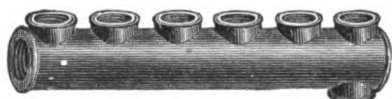


Plate 452.

No. 9.



Plate 453.

No. 10.

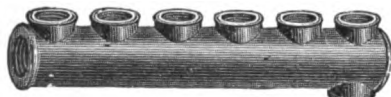


Plate 454.

No. 11.



Plate 455.

All openings in Branch Tees for Circulation are tapped right hand. Inlets and Outlets same size as Branches, unless otherwise ordered.

Number of Branches	Small Pattern, Inside diameter 1 1/4 inches		Large Pattern, Inside diameter 2 1/4 in.				Large Pattern, Inside diameter 2 1/2 in.				Large Pattern, Inside diameter 2 3/4 in.			
	2 1/2 inches, center to center, Nos. 1 and 2, for 1-inch Pipe		2 1/2 inches, center to center, Nos. 6 and 7, for 1-inch Pipe				3 inches, center to center, Nos. 8 and 9, for 1 1/4-inch Pipe				3 1/2 inches, center to center, Nos. 10 and 11, for 1 1/2-inch Pipe			
	Inlets		Inlets				Inlets				Inlets			
	1 in.	1 1/4 in.	1 in.	1 1/4 in.	1 1/2 in.	2 in.	1 1/4 in.	1 1/2 in.	2 in.	2 1/2 in.	1 1/2 in.	2 in.	2 1/2 in.	3 in.
2 . . .	\$0 90	90	90	1 15	1 30	1 55	1 30	1 30	1 50	1 95	2 10	2 10	2 85	3 15
3 . . .	1 05	1 05	1 00	1 25	1 40	1 65	1 65	1 65	1 90	2 40	2 70	2 70	3 45	3 80
4 . . .	1 15	1 15	1 20	1 45	1 60	1 85	2 00	2 00	2 40	2 85	3 35	3 35	4 15	4 60
5 . . .	1 35	1 35	1 40	1 65	1 80	2 05	2 40	2 40	2 90	3 55	4 00	4 00	5 00	5 50
6 . . .	1 60	1 60	1 70	1 95	2 10	2 35	2 80	2 80	3 30	3 95	4 65	4 65	5 75	6 25
7 . . .	1 90	1 90	2 15	2 40	2 55	2 80	3 20	3 20	3 90	4 20	5 25	5 25	6 50	7 25
8 . . .	2 20	2 20	2 40	2 65	2 80	3 05	3 60	3 60	4 50	4 95	5 85	5 85	7 00	7 75
9 . . .	2 65	2 65	2 80	3 05	3 20	3 45	4 30	4 30	5 25	6 15	.....	.....	.....	.....
10 . . .	3 15	3 15	3 30	3 55	3 70	3 95	4 80	4 80	5 85	6 85	7 60	7 60	9 25	10 00
11 . . .	3 75	3 75	4 20	4 45	4 60	4 85	.....	.....	.....	.....	.....	.....	.....	.....
12 . . .	4 40	4 40	4 75	5 00	5 15	5 40	5 25	5 25	6 50	.....	.....	.....	.....	.....
13 . . .	.....	.....	5 50	5 75	5 90	6 15	.....	.....	.....	.....	.....	.....	.....	.....
14 . . .	.....	.....	6 25	6 50	6 65	6 90	.....	.....	.....	.....	.....	.....	.....	.....
15 . . .	.....	.....	7 00	7 25	7 40	7 65	.....	.....	.....	.....	.....	.....	.....	.....
16 . . .	.....	.....	7 75	8 00	8 15	8 40	.....	.....	.....	.....	.....	.....	.....	.....

Always order by number.

Branch Tees not specified above made to order.

HOOK PLATES.**Plate 456.****Plate 457.**

Number of Hooks	1	2	3	4	5	6
For 1 inch Pipe, 2½ inches between centres	\$0 09	18	23	26	32	38
For 1¼ inch Pipe, 3 inches between centres	10	21	27	32	41	52
For 1½ inch Pipe, 3½ inches between centres	15	28	43	58	72	88
For 2 inch Pipe, 4½ inches between centres	22	43	65	90	1 15	1 35

Number of Hooks	7	8	9	10	11	12
For 1 inch Pipe, 2½ inches between centres	\$0 48	59	65	70	85	1 00
For 1¼ inch Pipe, 3 inches between centres	68	80	90	1 20	1 35	1 40
For 1½ inch Pipe, 4¼ inches between centres	1 10	1 25	1 40	1 55	1 65	1 90
For 2 inch Pipe, 4½ inches between centres . . . . .	.....	.....	.....	.....	.....	.....

EXPANSION PLATE.**Plate 458.**

Number of Hooks	1	2	3	4	5	6
For 1 inch Pipe, 2½ inches between centres	\$0 15	25	35	50	60	70
For 1¼ inch Pipe, 3 inches between centres	17	27	40	60	70	80
For 1½ inch Pipe, 3½ inches between centres	25	40	60	75	90	1 00

Number of Hooks	7	8	9	10	11	12
For 1 inch Pipe, 2½ inches between centres	\$0 80	95	1 10	1 35	1 55	1 70
For 1¼ inch Pipe, 3 inches between centres	90	1 15	1 30	1 50	1 70	2 00
For 1½ inch Pipe, 3½ inches between centres . . . . .	.....	.....	.....	.....	.....	.....

BEAM HOOK.

LONG SHANK.

**Plate 459.**

Size	½	¾	1	1¼	1½	2	2½	3 in.
Price, each	\$0 13	15	18	22	24	35	65	90

GAS HOOKS.**Plate 460.**

Size of Pipe	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Per 100	\$0 45	50	60	85	1 05	1 20	1 50	2 40

PLUMBERS' HOOKS.**Plate 461.**

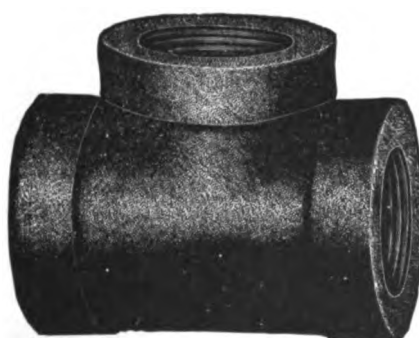
Per pound	\$0 25							
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TINNED STRAPS.**Plate 462.**

Size of Pipe	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Straps, per 100	\$1 00	1 00	1 00	1 50	2 00	2 50	3 50

CAST IRON FITTINGS.**CAR HEATER FITTINGS.****EXTRA HEAVY.****ELBOWS.****Plate 463.**

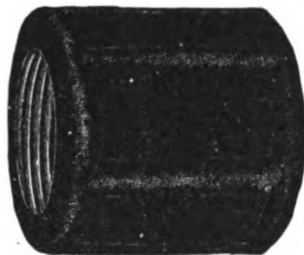
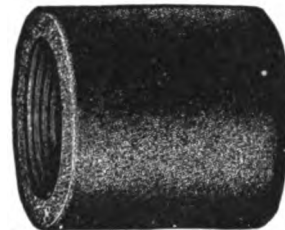
Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{3}{4}$	2 in.
Right Hand, each	\$0 22	25	27	30	45	45	55
Right and Left, each	22	25	27	30	45	45	55

TEES.**Plate 464.**

Size . . .	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	2 in.
Each . . .	\$0 30	35	40	45	45	45	45	65	85

CAST-IRON FITTINGS.**CAR HEATER FITTINGS.****EXTRA HEAVY.****RETURN BENDS.****Plate 465.**

Size	1¼	1¼	1¼	1¼	1¼	1¼ in.
Distance between Centers	2¾	3	4	5	7½	8 in.
Each	\$0 45	50	60	70	1 10	1 10

CAST-IRON COUPLINGS.**Plate 466.****WROUGHT-IRON COUPLINGS.****Plate 467.****CAST-IRON COUPLINGS.**

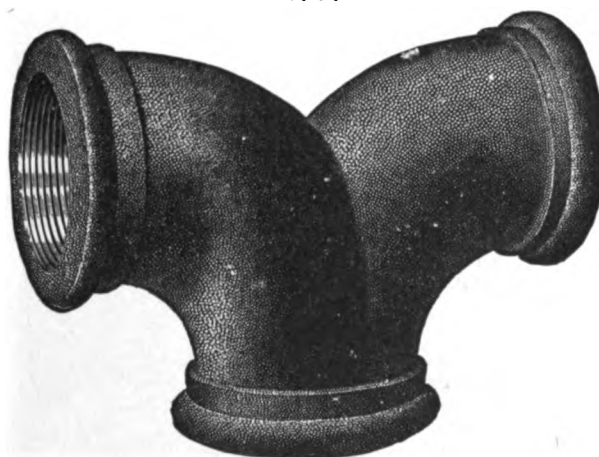
Size	1	1¼	1½	2 in.
Right Hand, each	\$0 25	30	45	55
Right and Left, each	35	40	55	65

WROUGHT-IRON COUPLINGS.

Size	½	¾	1	1¼	1½	2 in.
Actual Outside Diameter	1.09	1.31	1.63	2.13	2.31	2.78 in.
Length of Couplings	1.63	1.88	2.13	2.13	2.63	2.94 in.
Right Hand, each	\$0 10	15	20	30	40	50
Right and Left, each	15	22	30	40	50	60

CAST IRON FITTINGS.**LONG RADIUS ELLS.****BOREWED.****No. 1.****Plate 468.**

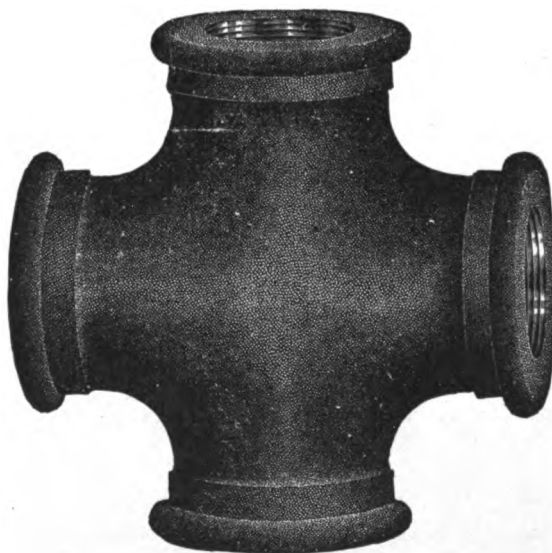
Size	1	1¼	1½	2	2½	3	3½	4 in.
Each	\$0 32	40	55	80	1 20	2 25	3 25	3 50
Reducing, each	48	60	83	1 20	1 80	3 38	4 88	5 25
Size	4½	5	6	7	8	9	10	12 in.
Each	\$5 50	6 50	8 75	13 00	17 00	29 50	30 00	40 00
Reducing, each	8 25	9 75	13 13	19 50	25 50	38 25	45 00	60 00

LONG RADIUS DOUBLE BRANCH ELLS.**BOREWED.****No. 2.****Plate 469.**

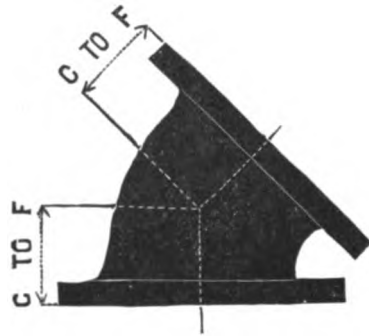
Size	1	1¼	1½	2	2½	3	3½	4 in.
Each	\$0 64	80	1 10	1 60	2 40	4 50	6 50	7 00
Reducing, each	96	1 20	1 65	2 40	3 60	6 75	9 75	10 50
Size	4½	5	6	7	8	9	10	12 in.
Each	\$11 00	13 00	17 50	26 00	34 00	51 00	60 00	80 00
Reducing, each	16 50	19 50	26 25	39 00	51 00	78 50	90 00	120 00

CAST IRON FITTINGS.**LONG RADIUS TEES.****BOREWED.****No. 3.****Plate 470.**

Size	1	1¼	1½	2	2½	3	3½	4	4½ in.
Each	\$ 0 48	60	82	1 20	1 80	3 40	4 90	5 25	8 25
Reducing	72	90	1 23	1 80	2 70	5 10	7 35	7 88	12 38
Size	5	6	7	8	9	10	12 in.	.....	.....
Each	\$ 9 75	13 25	19 50	25 50	38 00	45 00	60 00	.....	.....
Reducing	14 63	19 88	29 25	38 25	57 00	67 50	90 00	.....	.....

LONG RADIUS CROSSES.**BOREWED.****No. 4.****Plate 471.**

Size	1	1¼	1½	2	2½	3	3½	4 in.
Each	\$ 0 85	1 10	1 50	2 15	3 20	6 00	8 75	9 50
Size	5	6	7	8	9	10	12 in.	.....
Each	\$17 50	24 00	35 00	45 00	68 00	80 00	107 00	.....

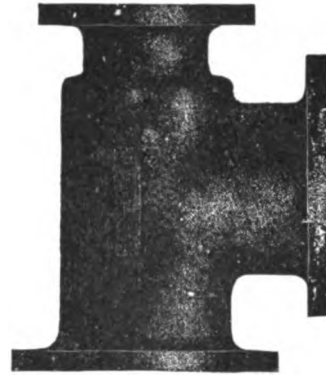
STANDARD FLANGED FITTINGS.**Plate 472.****Plate 473.****FLANGED ELBOWS.**

Size, Inches	Center to Face, Inches	Diam. of Flanges, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
2	4½	6½	\$ 4 75	\$ 5 75
3	5½	8	5 75	7 00
4	6	9	7 25	9 25
4½	6¼	9½	9 00	11 00
5	7	10	9 75	11 75
6	7½	11	12 00	14 00
7	8½	13	16 00	19 75
8	9½	14	20 00	23 75
9	10¾	15	26 00	30 00
10	11½	16	32 00	36 00
12	12¾	19	44 00	50 00
14	13¾	21	58 00	65 00
15	14½	22	72 00	80 00
16	15¼	24	84 00	93 00
18	16½	25	108 00	118 00
20	18	27	135 00	148 00
22	20	30	160 00	180 00
24	22	32	200 00	220 00

FLANGED ELBOWS.**45°**

Size, Inches	Center to Face, Inches	Diam. of Flanges, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
2	2½	6½	\$ 5 25	\$ 6 25
3	3	8	6 25	7 50
4	3½	9	8 00	10 00
4½	3¾	9½	10 00	12 00
5	3¾	10	10 75	12 75
6	4¼	11	13 00	15 00
7	5½	13	16 00	19 75
8	5¼	14	20 00	23 75
9	5¾	15	26 00	30 00
10	5½	16	32 00	36 00
12	6½	19	44 00	50 00
14	7¼	21	58 00	65 00
15	7½	22	72 00	80 00
16	7¾	24	84 00	93 00
18	7¾	25	108 00	118 00
20	9	27	135 00	148 00
22	10	30	160 00	180 00
24	10¾	32	200 00	220 00

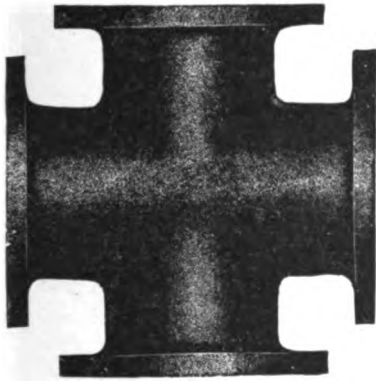
NOTE.—Flanged Fittings will always be furnished faced only, unless otherwise desired.

STANDARD FLANGED FITTINGS.**Plate 474.****Plate 475.****FLANGED TEES.****REDUCING FLANGED TEES.****REDUCING IN RUN OR BRANCH.**

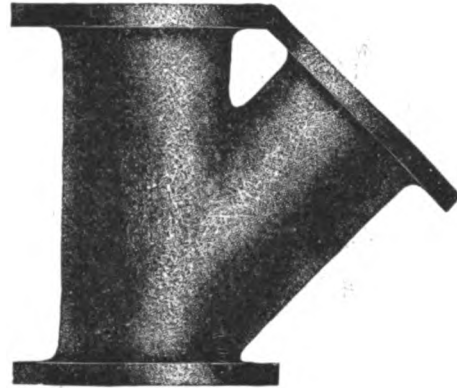
Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each	Size, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
2	4½	9	6½	\$ 7 00	\$ 8 50	2	\$ 8 00	\$ 9 50
3	5½	11	8	8 25	10 00	3	9 50	11 25
4	6	12	9	10 50	13 50	4	12 00	15 00
4½	6¾	12½	9½	13 00	16 00	4½	15 00	18 00
5	7	14	10	14 25	17 25	5	16 25	19 25
6	7½	15	11	17 50	20 50	6	20 00	23 00
7	8½	17	13	23 00	28 75	7	26 50	32 00
8	9½	19	14	29 00	34 75	8	33 50	39 00
9	10¾	21½	15	38 00	44 00	9	43 50	50 00
10	11½	23	16	46 50	52 50	10	53 50	60 00
12	12¾	25½	19	64 00	73 00	12	74 00	83 00
14	13¾	26½	21	84 00	95 00	14	96 00	107 00
15	14½	29	22	105 00	117 00	15	120 00	132 00
16	15¾	30½	24	122 00	135 00	16	140 00	153 00
18	16¾	33	25	155 00	170 00	18	178 00	193 00
20	18	36	27	195 00	215 00	20	225 00	245 00
22	20	40	30	230 00	260 00	22	265 00	295 00
24	22	44	32	290 00	320 00	24	335 00	365 00

NOTE.—Flanged Fittings will always be furnished faced only, unless otherwise ordered.

Reducing Fittings being made to order we are unable to give dimensions.

STANDARD FLANGED FITTINGS.**Plate 476.****FLANGED CROSSES.**

Size. Inches.	Face to Face. Inches.	Diam. of Flanges. Inches.	With Faced Flanges, Each.	With Faced and Drilled Flanges, Each.
2	9	6½	\$ 9 50	\$ 11 50
3	11	8	11 50	14 00
4	12	9	14 00	18 50
4½	12½	9½	18 00	22 00
5	14	10	19 50	23 50
6	15	11	24 00	28 00
7	17	13	32 00	39 50
8	19	14	40 00	47 50
9	21½	15	52 00	60 00
10	23	16	64 00	72 00
12	25½	19	88 00	100 00
14	26½	21	116 00	130 00
15	29	22	144 00	160 00
16	30½	24	168 00	186 00
18	33	25	216 00	236 00
20	36	27	270 00	296 00
22	40	30	320 00	360 00
24	44	32	400 00	440 00

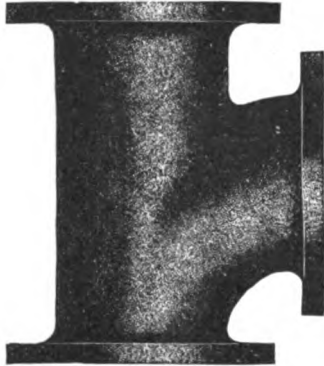
**Plate 477.****FLANGED LATERALS.**

Size. Inches.	Diam. of Flanges. Inches.	With Faced Flanges, Each.	With Faced and Drilled Flanges. Each.
2	....	\$ 9 50	\$ 11 50
3	....	11 50	14 00
4	9	14 50	18 50
4½	9½	18 00	22 00
5	10	19 50	23 50
6	11	24 00	28 00
7	13	32 00	39 50
8	14	40 00	47 50
9	15	52 00	60 00
10	16	64 00	72 00
12	19	88 00	100 00
14	21	116 00	130 00
15	22	144 00	160 00
16	24	168 00	186 00
18	25	216 00	236 00

Reducing Crosses and Laterals made to order at an advance of 12½ per cent net.

NOTE.—Flanged Fittings will always be furnished faced only unless otherwise ordered.

Flanged Laterals being made to order we are unable to give dimensions.

STANDARD FLANGED FITTINGS.**Plate 478.****Plate 479.****SINGLE SWEEP
FLANGED TEES.**

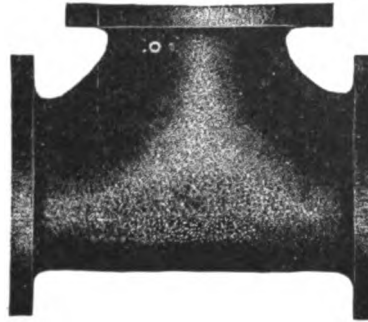
Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
2	4½	9	6½	\$ 8 00	\$ 9 50
3	5½	11	8	9 50	11 25
4	6	12	9	12 00	15 00
4½	6¾	12½	9½	15 00	18 00
5	7	14	10	16 25	19 25
6	7½	15	11	20 00	23 00
7	8½	17	13	26 50	32 00
8	9½	19	14	33 50	39 00
9	10¾	21½	15	43 50	50 00
10	11½	23	16	53 50	60 00
12	12¾	25½	19	74 00	83 00
14	13¾	28½	21	96 00	107 00
15	14½	29	22	120 00	132 00
16	15¼	30½	24	140 00	153 00
18	16½	33	25	178 00	193 00
20	18	36	27	225 00	245 00
22	20	40	30	265 00	295 00
24	22	44	32	335 00	365 00

**REDUCING SINGLE SWEEP
FLANGED TEES.
REDUCING IN RUN OR BRANCH.**

Size, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
2	\$ 9 25	\$ 10 75
3	11 00	12 75
4	13 75	16 75
4½	17 25	20 25
5	18 75	21 75
6	23 00	26 00
7	30 00	33 50
8	38 50	44 00
9	50 00	56 50
10	61 50	68 00
12	85 00	94 00
14	110 00	121 00
15	138 00	150 00
16	160 00	173 00
18	205 00	220 00
20	258 00	278 00
22	305 00	335 00
24	385 00	415 00

NOTE.—Flanged Fittings will always be furnished faced only, unless otherwise ordered.

Reducing Fittings being made to order we are unable to give dimensions.

STANDARD FLANGED FITTINGS.**Plate 480.****DOUBLE SWEEP FLANGED TEES.**

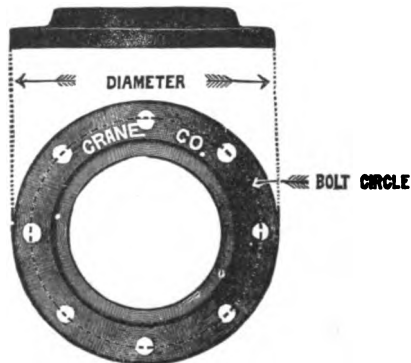
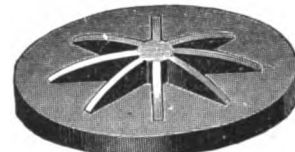
Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
4	6	12	9	\$ 12 00	\$ 15 00
5	7	14	10	16 25	19 25
6	7½	15	11	20 00	23 00
7	8½	17	13	26 50	32 00
8	9½	19	14	33 50	39 00
9	10¾	21½	15	43 50	50 00
10	11½	23	16	53 50	60 00
12	12¾	25½	19	74 00	83 00
14	13¾	26½	21	96 00	107 00
15	14½	29	22	120 00	132 00
16	15¼	30½	24	140 00	153 00
18	16½	33	25	178 00	193 00
20	18	36	27	225 00	245 00
22	20	40	30	265 00	295 00
24	22	44	32	335 00	365 00

**REDUCING DOUBLE SWEEP
FLANGED TEES.**

Size, Inches	With Faced Flanges, Each	With Faced and Drilled Flanges, Each
4	\$ 13 75	\$ 16 75
5	18 75	21 75
6	23 00	26 00
7	30 00	35 50
8	38 50	44 00
9	50 00	56 50
10	61 50	68 00
12	85 00	94 00
14	110 00	121 00
15	138 00	150 00
16	160 00	173 00
18	205 00	220 00
20	258 00	278 00
22	305 00	335 00
24	385 00	415 00

These fittings are not made reducing on the run. Can only increase or decrease branch within a reasonable limit, which must be regulated by our patterns.

NOTE.—Flanged fittings will always be furnished faced only, unless otherwise ordered. Reducing fittings being made to order, we are unable to give dimensions.

STANDARD FLANGED FITTINGS.**Plate 481.****Plate 482.****BLIND FLANGES.**
16 inches and under.**Plate 483.****BLIND FLANGES.**

19 inches and larger.

FACED FLANGES.

Size, Inches	Faced, Each	Faced and Drilled, Each
2 x 6½	\$ 1 20	\$ 1 50
2½ x 7	1 40	2 00
3 x 8	1 60	2 25
3½ x 8½	1 80	2 50
4 x 9	2 15	3 00
4½ x 9½	2 50	3 35
5 x 10	2 80	3 65
6 x 11	3 20	4 00
7 x 13	4 35	5 75
8 x 14	5 00	6 50
9 x 15	6 75	8 25
10 x 16	7 75	9 25
12 x 19	10 50	12 50
14 x 21	13 75	16 00
15 x 22	18 00	21 00
16 x 24	22 50	26 00
18 x 25	27 50	31 00
20 x 27	30 00	34 00
22 x 30	33 75	39 00
24 x 32	41 00	46 00

TEMPLATE FOR DRILLING.

Size, Inches	Diameter of Flanges, Each	Faced, Each	Faced and Drilled, Each	Bolt Circle, Inches	Number of Bolts	Size of Bolts
2	6½	\$ 1 40	\$ 1 70	5	4	⅝
2½	7	1 60	2 20	5½	4	⅝
3	8	1 85	2 50	6½	4	⅝
3½	8½	2 10	2 80	6¾	4	⅝
4	9	2 50	3 35	7¼	8	½
4½	9½	2 90	3 75	7¾	8	½
5	10	3 25	4 10	8¼	8	⅝
6	11	3 70	4 50	9¼	8	⅝
7	13	5 00	6 40	11	12	⅝
8	14	5 75	7 25	12	12	⅝
9	15	7 75	9 25	13	12	¾
10	16	9 00	10 60	14¼	12	¾
12	19	14 00	16 00	17	16	¾
14	21	17 50	19 75	18½	16	¾
15	22	22 50	25 50	19½	16	⅞
16	24	28 00	31 50	21½	20	⅞
18	25	33 00	36 50	22½	20	⅞
20	27	36 00	40 00	24¾	20	⅞
22	30	41 00	46 00	27½	24	⅞
24	32	50 00	55 00	29½	24	⅞

NOTE.—All the Flanges on our Flanged Fittings are drilled in multiples of four, so that fittings may be made to face in any quarter.

AMMONIA FITTINGS.**ELBOWS.****Plate 484.**

Straight Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$ in.
Each	\$0 56	76	90	1 15	2 00	2 10
Reducing sizes, to reduce 1 size	75	1 00	1 15	1 50	2 50	2 65
Straight Sizes	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4	5 in.
Each	\$2 75	4 10	5 75	9 00	14 00	19 25
Reducing Sizes, to reduce 1 size each	3 50	5 25	7 25	11 50	18 00	25 00

Reducing more than one size, prices on application.

ELBOWS**HALF FLANGED—ONE END BEING FLANGED. THE OTHER WITH GLAND CONNECTION.**

Size	2	2 $\frac{1}{2}$	3	4	5 in.
Each	\$6 25	9 50	12 50	19 00	34 00

TEES.**Plate 485.**

Straight Sizes	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$ in.
Each	\$0 70	90	1 25	1 75	2 50	3 00
Reducing Sizes, to reduce 1 size, each	90	1 15	1 60	2 25	3 25	3 75
Straight Sizes	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	4 in.	
Each	\$4 00	6 00	8 50	13 00	19 00	
Reducing Sizes, to reduce 1 size, each	5 00	8 00	10 75	16 25	24 00	

Reducing more than one size, prices on application.

CROSSES.**Plate 486.**

Size	$\frac{3}{4}$ x $\frac{1}{2}$	1 x $\frac{1}{2}$ in.
Each	\$3 20	3 80

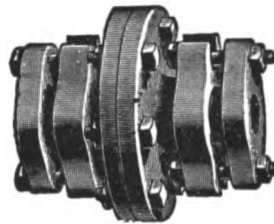
AMMONIA FITTINGS.**COUPLINGS.****Plate 487.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$0 45	60	80	1 10	1 50	2 00	2 50	3 75	5 00.	13 00

All Couplings made R. and L., unless otherwise ordered.

RETURN BENDS.**Plate 488.**

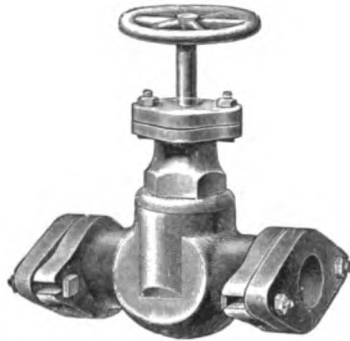
Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$1 50	2 00	3 00	5 00	6 20	7 50	9 50

AMMONIA FLANGE UNIONS.**Plate 489.**

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5 in.
Each	\$5 10	6 20	7 30	8 65	10 00	14 00	18 00	23 00	26 00	38 00

AMMONIA STRAINERS.**Plate 490.**

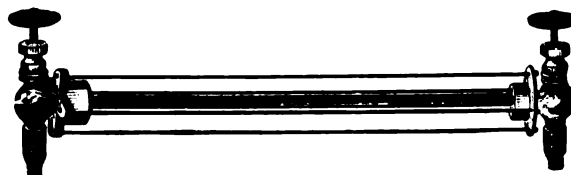
Size	1	2 in.
Each	\$11 00	13 50

AMMONIA FITTINGS.**GLOBE VALVES.****Plate 491.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$ in.
Each	\$ 3 00	4 00	5 00	6 50	8 00	9 00
Size	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5 in.
Each	\$10 50	12 25	18 25	22 50	.....	.....

CHECK VALVES.**Plate 492.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each	\$2 15	3 00	3 50	4 50	7 50	8 50	9 50	10 25	15 00	18 50

AUTOMATIC GAUGES.**Plate 493.**

Complete, including Guards and Glass \$10 00

AMMONIA FITTINGS.

ASBESTOS PACKED ALL IRON AMMONIA COCKS.

GLAND END.

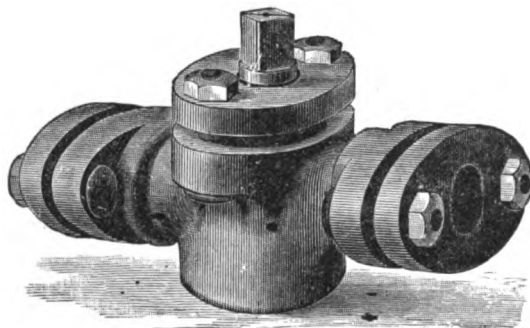


Plate 494.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$1 45	1 60	2 10	2 50	3 50	4 75	7 00	12 00	18 00	27 00

BRANCH TEE HEADERS.

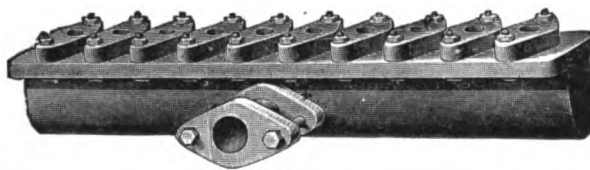


Plate 495.

NUMBER OF OUTLETS.

5 $\frac{3}{4}$ inch	\$ 8 25
10 $\frac{3}{4}$ inch	13 00
7 1 inch, $3\frac{1}{8}$ inch Center to Center, and with 1, $1\frac{1}{4}$ or $1\frac{1}{2}$ inch Back or Side Outlets.	18 50
3 $1\frac{1}{4}$ inch, and with $\frac{3}{4}$ inch Side Outlet	6 00
3 $1\frac{1}{4}$ inch, and with $1\frac{1}{4}$ inch Side Outlet.	6 25
12 $1\frac{1}{4}$ inch, 6 inch Center to Center	24 00
4 $1\frac{1}{2}$ inch, 5 inch Center to Center, and with 3 inch Back Outlet	10 75
5 $1\frac{1}{2}$ inch, 5 inch Center to Center, $1\frac{1}{2}$, 2 or $2\frac{1}{2}$ inch Back Outlet	13 50

PIPE COILED ALL SIZES AND SHAPES.

HEATER COILS.



Plate 496.

COIL FOR BOILING SOAP.



Plate 497.

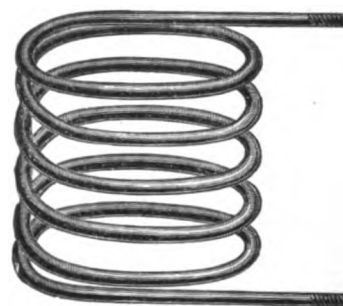


Plate 498.

FLAT TANK COIL.

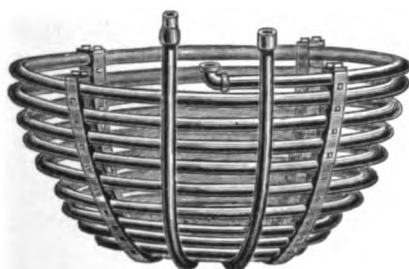


Plate 499.

TUYERE COIL.
FOR BLAST FURNACE.



Plate 500.

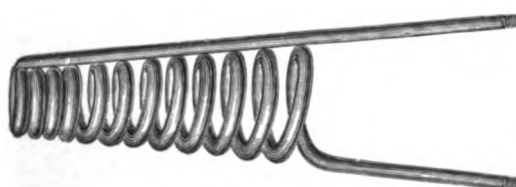


Plate 501.

WATER BACK COOLING COILS.

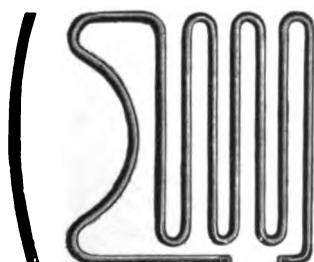


Plate 502.

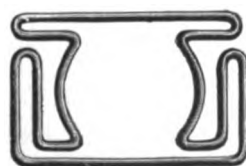


Plate 503.

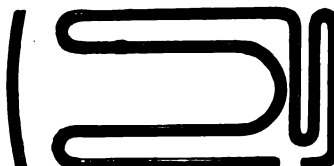


Plate 504.

Prices furnished on application.

BRACKET COILS.

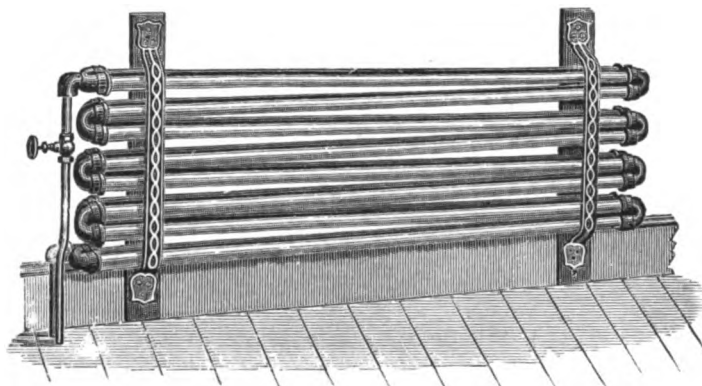


Plate 505.

12 PIPES HIGH.

Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Price, per foot, 2 Pipes wide . .	\$0 21½	22	22½	23	23½	24½	25½	26½	27½	29½
Price, per foot, 1 Pipe wide . .	23	23½	24	24½	25	26	27	28	29	31

10 PIPES HIGH

Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Price, per foot, 2 Pipes wide . .	\$0 22½	23	23½	24	24½	25½	26½	27½	28½	30½
Price, per foot, 1 Pipe wide . .	24	24½	25	25½	26	27	28	29	30	32

8 PIPES HIGH.

Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Price, per foot, 2 Pipes wide . .	\$0 23½	24	24½	25	25½	26½	27½	28½	29½	31½
Price, per foot, 1 Pipe wide . .	25	25½	26	26½	27	28	29	30	31	33

6 PIPES HIGH.

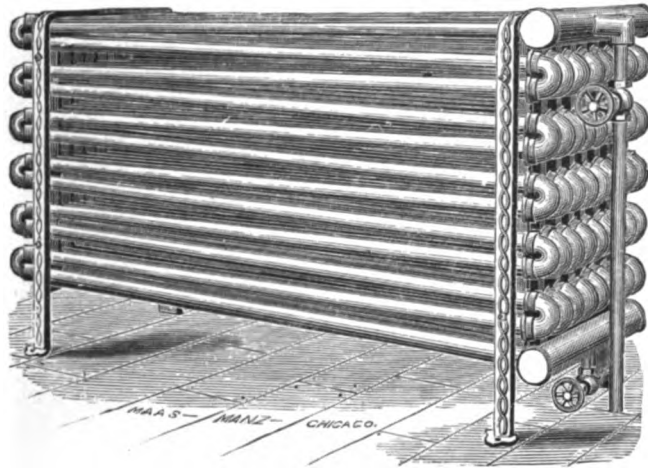
Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Price, per foot, 2 Pipes wide . .	\$0 24½	25	25½	26	26½	27½	28½	29½	30½	32½
Price, per foot, 1 Pipe wide . .	26	26½	27	27½	28½	29	30	31	32	34

The above prices are based on Coils made of Whole Pipe without Couplings.

COIL STANDS, SLATS, ETC.

Ornamental Coil Stand (Light Pattern)	}	Market Rates.
Ornamental Coil Stand (Heavy Pattern)		
Ornamental Coil Stand for Wall Coils		
Slats, for Plain and Ornamental Coils		
Malleable Straps, for Plain Box Coils		
Wrought Iron Coil Rods		
Wrought Iron Bracket Coil Rods		

NOTE.—All our Coils before leaving the shop are thoroughly tested, and are perfectly tight. We can not guarantee them against the risk of transportation.

BOX COILS.**Plate 506.****12 PIPES HIGH.**

Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Per foot	\$0 21	21½	22	22½	23	24	25	26	27	29

10 PIPES HIGH.

Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Per foot	\$0 22	22½	23	23½	24	25	26	27	28	30

8 PIPES HIGH.

Length	8	7	6	5½	5	4½	4	3½	3	2½ ft.
Per foot	\$0 23	23½	24	24½	25	26	27	28	29	31

The above prices are based on Coils made of Whole Pipe without Couplings.

NOTE.—All our Coils before leaving the shop are thoroughly tested and are perfectly tight. We cannot guarantee them against the risk of transportation.

WROUGHT TUBE STEAM RADIATOR.

Made only four tubes wide, any number of sections long. Each section $8\frac{7}{8}$ inches wide by $2\frac{1}{4}$ face to face. Weight per tube, 32 inches over all, 5 pounds. Radiators will be made for marble tops if desired. Made any height desired, to fraction of an inch. Sizes less than 20 and more than 45 inches over all, special.

**TABLE FOR COMPUTING HIGH AND LOW RADIATORS,
SECTIONAL STEAM AND HOT WATER.**

32 inches over all equals one square foot of Heating Surface—Standard.

A Height of Radiator, Inches	B Sq. ft. sur- face in 1 Pipe	C No. tubes to 1 sq. ft.	A Height of Radiator, Inches	B Sq. ft. sur- face in 1 pipe	C No. tubes to 1 sq. ft.
14	.419	2.384	34	1.064	.939
15	.451	2.213	35	1.096	.911
16	.483	2.066	36	1.129	.885
17	.516	1.937	37	1.161	.861
18	.548	1.823	38	1.193	.837
19	.58	1.722	39	1.225	.815
20	.612	1.631	40	1.258	.794
21	.645	1.55	41	1.29	.775
22	.677	1.476	42	1.322	.756
23	.709	1.409	43	1.354	.738
24	.742	1.347	44	1.387	.72
25	.774	1.291	45	1.419	.704
26	.806	1.24	46	1.451	.688
27	.838	1.192	47	1.483	.673
28	.87	1.148	48	1.516	.659
29	.903	1.107	49	1.548	.645
30	.935	1.069	50	1.58	.632
31	.967	1.033	51	1.613	.62
32	1	1	52	1.645	.607
33	1.032	.968			



Plate 507.

We have no table of standard sizes, as they can be made any size. The above table shows the heating surface of any size and height. To find the number of square feet radiation in any height Radiator—multiply the number of tubes in Radiator by figure in column B opposite the height desired, and you have total square feet. To find the size Radiator required for a given number of square feet of radiation and height—multiply figure in column C by number of feet of radiation in the line of desired height, and you have the number of tubes.

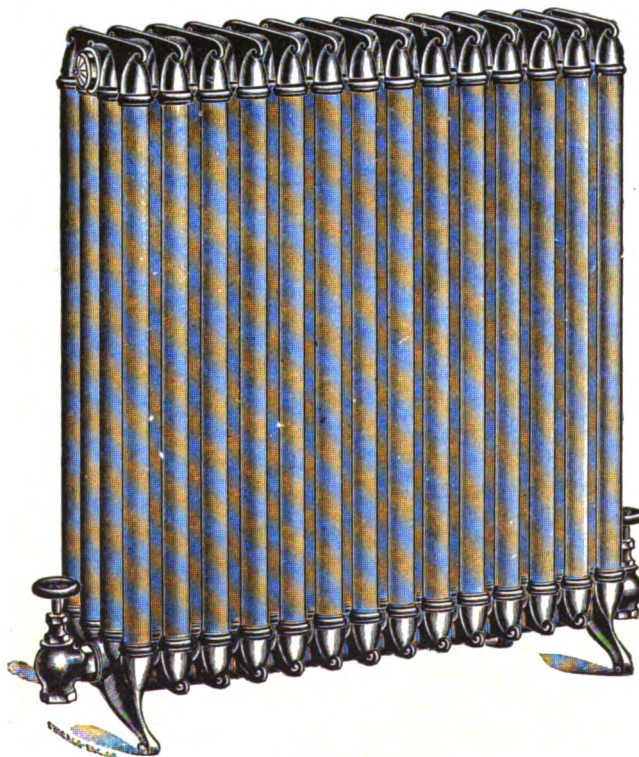


Plate 508.

WROUGHT TUBE HOT WATER RADIATOR.

MADE 3, 4, OR 6 TUBES WIDE.

Dimensions of Sections—3 wide, $6\frac{1}{4}$ inches by $2\frac{1}{4}$ inches, face to face; 4 wide, $8\frac{7}{8}$ inches by $2\frac{1}{4}$ inches, face to face; 6 wide, 13 inches by $2\frac{1}{4}$ inches, face to face.

Weight, 4 wide, 32 inches high, $5\frac{1}{2}$ pounds to the tube; 32 inches over all, standard per tube one square foot heating surface, 27 inches from center of top to center of bottom opening.

Made any height to fraction of an inch. Sizes less than 20 inches and more than 45 inches over all, special.

STANDARD VERTICAL RADIATORS.

TWO ROWS OF TUBES.

FOR STEAM.

**Plate 509.**

Number of Rows	2	2	2	2	2	2	2	2	2
Tubes in Each Row	4	6	8	10	12	16	20	24	32
Square Feet Heating Surface .	8	12	16	20	24	32	40	48	64
Height	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$ in.
Length	11 $\frac{1}{4}$	15 $\frac{1}{2}$	19 $\frac{3}{4}$	24	28 $\frac{1}{4}$	36 $\frac{3}{4}$	45 $\frac{1}{4}$	53 $\frac{3}{4}$	70 $\frac{3}{4}$ in.
Width	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$ in.
Size of Inlet for Single Pipe .	1	1	1	1	1	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$ in.
Size of Inlet for Double Pipe .	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1
Size of Outlet for Double Pipe.	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$ in.
Length of Marble Top	10	14 $\frac{1}{4}$	18 $\frac{3}{4}$	23	27 $\frac{1}{2}$	35 $\frac{3}{4}$	44 $\frac{1}{2}$	53	70 $\frac{3}{4}$ in.
Width of Marble Top	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$ in.

Distance between centers of feed and return openings, 3 $\frac{1}{2}$ inches.

Radiators will be arranged for supply and return valves on same end, unless otherwise ordered.

We make only the sizes above specified in two rows.

Prices on application.

Quotations, when made, are for radiators unpainted, with iron tops and without valves, unless otherwise specified.

We can furnish these Radiators three and four rows wide if desired.

CIRCULAR RADIATORS.

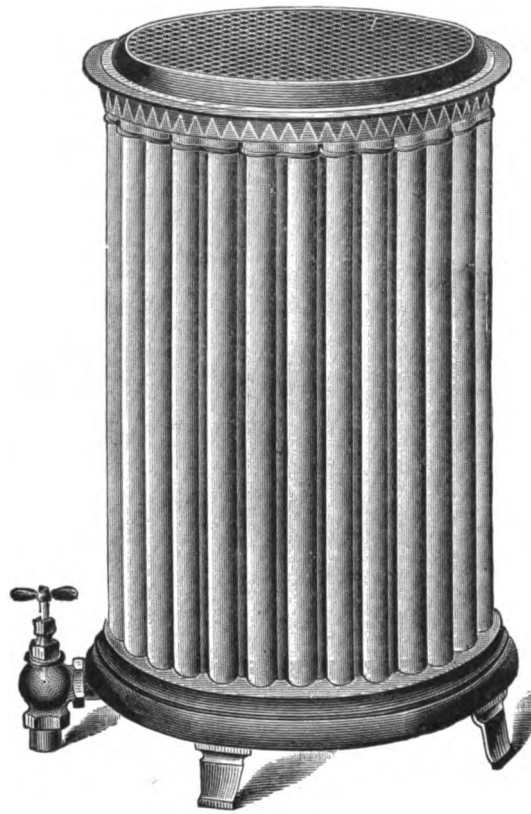


Plate 510.

Number of Radiator	1	2	3	4	5
Number of Tubes	18	36	54	84	120
Square Feet Heating Surface	18	36	54	84	120
Height	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$	34 $\frac{1}{4}$ in.
Outside Diameter	13	17	21	25 $\frac{1}{4}$	29 in.
Size of Inlet for Single Pipe	1	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2 in.
Size of Inlet for Double Pipe	$\frac{3}{4}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$ in.
Size of Outlet for Double Pipe	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$ in.

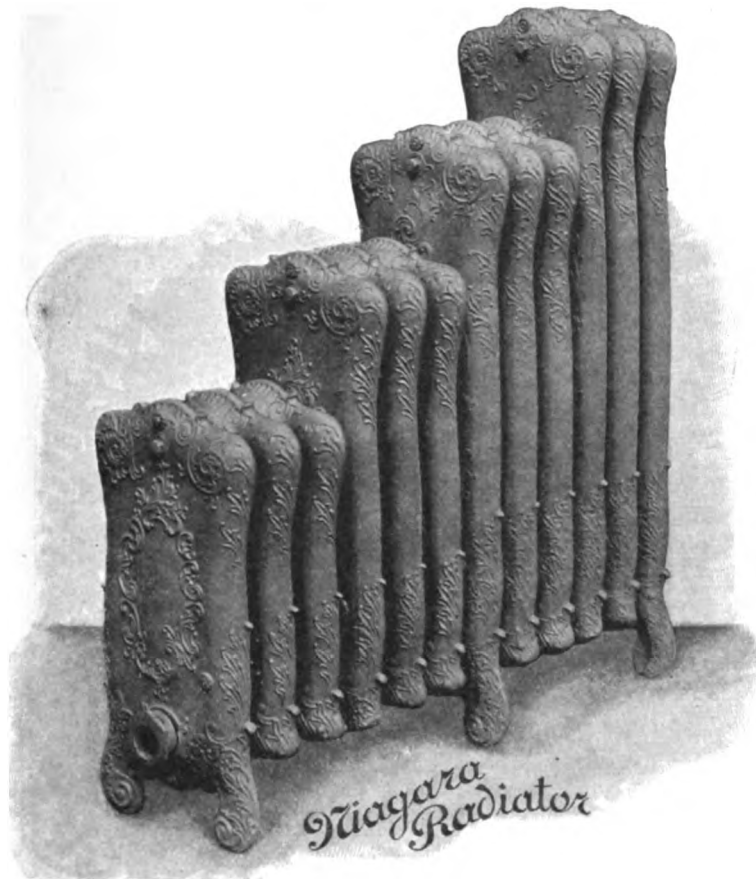
We make only the sizes above specified.

Prices on application.

Quotations, when made, are for Radiators unpainted, with iron tops and without valves, unless otherwise specified.

NIAGARA RADIATOR.

FOR STEAM OR WATER.

**Plate 511.****NIAGARA RADIATOR.**

STEAM OR WATER.

Direct, 38 inches high, per square foot	\$0 20
Direct, 32 inches high, per square foot	22
Direct, 27 inches high, per square foot	24
Direct, 21 inches high, per square foot	26

Curved (to any diameter), add 50 cents per loop to above prices.

Column, add 50 cents per loop to above prices.

Direct—Indirect, add 14 cents per loop to above prices.

High Legs, add 20 cents per radiator.

NIAGARA JUNIOR.

STEAM OR WATER.

40 inches high, 4 square foot per loop, per square foot	\$0 20
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NIAGARA RADIATOR.

STEAM OR WATER.

Pin—Indirect, 16 square foot per section, per section	\$2 00
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NIAGARA RADIATORS.



Plate 512.

HEATING SURFACE IN SQUARE FEET

No. Sections	Length, Inches	38 Inches High	32 Inches High	27 Inches High	21 Inches High
2	6	14 sq. ft.	12 sq. ft.	10 sq. ft.	8 sq. ft.
3	9	21 sq. ft.	18 sq. ft.	15 sq. ft.	12 sq. ft.
4	12	28 sq. ft.	24 sq. ft.	20 sq. ft.	16 sq. ft.
5	15	35 sq. ft.	30 sq. ft.	25 sq. ft.	20 sq. ft.
6	18	42 sq. ft.	36 sq. ft.	30 sq. ft.	24 sq. ft.
7	21	49 sq. ft.	42 sq. ft.	35 sq. ft.	28 sq. ft.
8	24	56 sq. ft.	48 sq. ft.	40 sq. ft.	32 sq. ft.
9	27	63 sq. ft.	54 sq. ft.	45 sq. ft.	36 sq. ft.
10	30	70 sq. ft.	60 sq. ft.	50 sq. ft.	40 sq. ft.
11	33	77 sq. ft.	66 sq. ft.	55 sq. ft.	44 sq. ft.
12	36	84 sq. ft.	72 sq. ft.	60 sq. ft.	48 sq. ft.
13	39	91 sq. ft.	78 sq. ft.	65 sq. ft.	52 sq. ft.
14	42	98 sq. ft.	84 sq. ft.	70 sq. ft.	56 sq. ft.
15	45	105 sq. ft.	90 sq. ft.	75 sq. ft.	60 sq. ft.
16	48	112 sq. ft.	96 sq. ft.	80 sq. ft.	64 sq. ft.
17	51	119 sq. ft.	102 sq. ft.	85 sq. ft.	68 sq. ft.
18	54	126 sq. ft.	108 sq. ft.	90 sq. ft.	72 sq. ft.
19	57	133 sq. ft.	114 sq. ft.	95 sq. ft.	76 sq. ft.
20	60	140 sq. ft.	120 sq. ft.	100 sq. ft.	80 sq. ft.
21	63	147 sq. ft.	126 sq. ft.	105 sq. ft.	84 sq. ft.
22	66	154 sq. ft.	132 sq. ft.	110 sq. ft.	88 sq. ft.
23	69	161 sq. ft.	138 sq. ft.	115 sq. ft.	92 sq. ft.
24	72	168 sq. ft.	144 sq. ft.	120 sq. ft.	96 sq. ft.
25	75	175 sq. ft.	150 sq. ft.	125 sq. ft.	100 sq. ft.
26	78	182 sq. ft.	156 sq. ft.	130 sq. ft.	104 sq. ft.
27	81	189 sq. ft.	162 sq. ft.	135 sq. ft.	108 sq. ft.
28	84	196 sq. ft.	168 sq. ft.	140 sq. ft.	112 sq. ft.
29	87	203 sq. ft.	174 sq. ft.	145 sq. ft.	116 sq. ft.
30	90	210 sq. ft.	180 sq. ft.	150 sq. ft.	120 sq. ft.

All Niagara Radiators are tapped two inches and bushed as follows:

ONE PIPE WORK.

Radiators containing 24 sq. ft. and under . . . 1 in.
 Above 24, but not exceeding 60 ft. . . . 1¼ in.
 Above 60, but not exceeding 100 ft. . . . 1½ in.
 Above 100 sq. ft. 2 in.

STEAM.

TWO PIPE WORK.

Radiators containing 48 square feet and under . . . 1 x ¾ in.
 Above 48, but not exceeding 96 feet . . . 1¼ x 1 in.
 Above 96 square feet 1½ x 1¼ in.

HOT WATER.

TAPPED FOR SUPPLY AND RETURN.

Radiators containing 40 square feet and under 1 in.
 Above 40, but not exceeding 72 square feet 1¼ in.
 Above 72 square feet 1½ in.

Each section is 10½ inches wide over all.

Distance from center of tapping to floor is 5 inches for both steam and water.

Can furnish special height leg sections, tappings ranging from 6 to 9 inches from center of opening to floor, as required.

In estimating length of Radiator make no extra allowance for the bushings.

In ordering, always state whether for steam or water, and if for steam, whether one pipe or two pipe system.

STANDARD RADIATORS. FOR STEAM AND HOT WATER.

TWO COLUMN.



Plate 513.

THREE COLUMN.

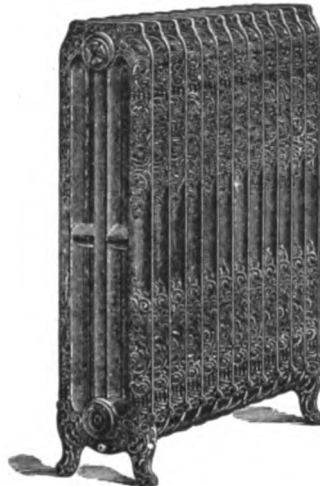


Plate 514.

FOUR COLUMN.

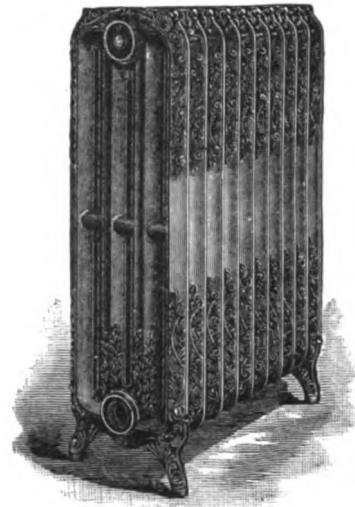


Plate 515.

DIRECT RADIATION.

STEAM OR WATER.

ST. LOUIS STANDARD TWO COLUMN.

45 Inches high, per foot	\$0 41
38 Inches high, per foot	42
32 Inches high, per foot	46
26 Inches high, per foot	49
20 Inches high, per foot	57

ST. LOUIS STANDARD THREE COLUMN.

44 Inches high, per foot	\$0 41
38 Inches high, per foot	42
32 Inches high, per foot	46
26 Inches high, per foot	49
22 Inches high, per foot	53
20 Inches high, per foot	57
18 Inches high, per foot	58

ST. LOUIS STANDARD FOUR COLUMN.

44 Inches high, per foot	\$0 41
38 Inches high, per foot	42
32 Inches high, per foot	46
26 Inches high, per foot	49
22 Inches high, per foot	53
20 Inches high, per foot	57
18 Inches high, per foot	58

ST. LOUIS STANDARD WINDOW.

15 Inches high, per foot	\$ 60
------------------------------------	-------

INDIRECTS.

Standard Indirect, 12-foot loop, per section	\$3 00
Standard Indirect, 15-foot loop, per section	4 00

SPECIALTIES—NET CASH.

Circular or Column, per section extra	\$0 50
Curved, per section extra	50
Direct Indirect, Regular Loop, per section extra	14
Direct Indirect, Four Column, per section	20

Special Legs, in following heights, 6, 6½, 7, 8, 9 and 10 inches from center of opening to floor, 25 cents extra per leg section.

TWO-COLUMN STANDARD RADIATORS.**LIST OF SIZES.**

Number of Loops	Length, Inches	Openings for Single Pipe, Inches	Two Pipe Openings,		Heating Surface—Square Feet.				
			Supply	Return	45 Inches High	88 Inches High	32 Inches High	26 Inches High	20 Inches High
2	5	1	1	x ¾	10	8	6½	5½	4
3	7½	1	1	¾	15	12	10	8	6
4	10	1	1	¾	20	16	13½	10½	8
5	12½	1	1	¾	25	20	16½	13½	10
6	15	1¼	1	¾	30	24	20	16	12
7	17½	1¼	1	¾	35	28	23½	18½	14
8	20	1¼	1	¾	40	32	26½	21½	16
9	22½	1¼	1	¾	45	36	30	24	18
10	25	1¼	1	¾	50	40	33½	26½	20
11	27½	1¼	1¼	x ¾	55	44	36½	29½	22
12	30	1¼	1¼	¾	60	48	40	32	24
13	32½	1¼	1¼	¾	65	52	43½	34½	26
14	35	1¼	1¼	¾	70	56	46½	37½	28
15	37½	1¼	1¼	1	75	60	50	40	30
16	40	1½	1¼	1	80	64	53½	42½	32
17	42½	1½	1¼	1	85	68	56½	45½	34
18	45	1½	1¼	1	90	72	60	48	36
19	47½	1½	1¼	1	95	76	63½	50½	38
20	50	1½	1¼	1	100	80	66½	53½	40
21	52½	1½	1½	x 1	105	84	70	56	42
22	55	1½	1½	1	110	88	73½	58½	44
23	57½	1½	1½	1	115	92	76½	61½	46
24	60	1½	1½	1	120	96	80	64	48
25	62½	1½	1½	1	125	100	83½	66½	50
26	65	2	1½	1¼	130	104	86½	69½	52
27	67½	2	1½	1¼	135	108	90	72	54
28	70	2	1½	1¼	140	112	93½	74½	56
29	72½	2	1½	1¼	145	116	96½	77½	58
30	75	2	1½	1¼	150	120	100	80	60
31	77½	2	1½	1¼	155	124	103½	82½	62
32	80	2	1½	1¼	160	128	106½	85½	64

Width of Loop, 7¼ inches. Width across feet, 8¼ inches.

When not ordered otherwise, Radiators will be tapped as above. If openings, varying from the above are required, they will be provided without extra charge.

Radiators with 6 inch legs furnished without extra charge. Distance from center of opening to floor, 7½ inches.

HOT-WATER RADIATORS.

The heights and capacities of our Hot Water Radiators are the same as in the Steam Radiators. The flow and return openings are tapped as follows:

Radiators containing 40 square feet and under. 1 in.
 Above 40, but not exceeding 72 square feet 1¼ in.
 Above 72 square feet 1½ in.

Distance from center of opening to floor about 4½ inches.

STANDARD THREE COLUMN RADIATORS.

LIST OF SIZES.

No. of Sections.	Length, Inches.	Tapped for Hot Water, Flow and Return, Inches.	Tapped for Steam.		Heating Surface, Square Feet.			
			Supply.	Return.	38 Inches High.	32 Inches High.	26 Inches High.	20 Inches High.
3	7½	1	1	x ¾	15	12¾	10½	8¼
4	10	1	1	¾	20	17	14	11
5	12½	1	1	¾	25	21¼	17½	13¾
6	15	1	1	¾	30	25½	21	16½
7	17½	1	1	¾	35	29¾	24½	19¼
8	20	1	1	¾	40	34	28	22
9	22½	1	1	¾	45	38¼	31½	24¾
10	25	1	1	¾	50	42½	35	27½
11	27½	1¼	1¼	x 1	55	46¾	38½	30¼
12	30	1¼	1¼	1	60	51	42	33
13	32½	1¼	1¼	1	65	55¼	45½	35¾
14	35	1¼	1¼	1	70	59½	49	38½
15	37½	1¼	1¼	1	75	63¾	52½	41¼
16	40	1¼	1¼	1	80	68	56	44
17	42½	1¼	1¼	1	85	72¼	59½	46¾
18	45	1¼	1¼	1	90	76½	63	49½
19	47½	1¼	1¼	1	95	80¾	66½	52¼
20	50	1¼	1¼	1	100	85	70	55
21	52½	1¼	1¼	1	105	89¼	73½	57¾
22	55	1¼	1¼	1	110	93½	77	60½
23	57½	1¼	1¼	1	115	97¾	80½	63¾
24	60	1¼	1¼	1	120	102	84	66
25	62½	1¼	1¼	1	125	106¼	87½	68¾
26	65	1¼	1¼	1	130	110½	91	71½
27	67½	1¼	1¼	1	135	114¾	94½	74¼
28	70	1¼	1¼	1	140	119	98	77
29	72½	1¼	1¼	1	145	123¼	101½	79¾
30	75	1¼	1¼	1	150	127½	105	82½

The Standard section is 2¼ inches across top, and is 9 inches wide.

STANDARD FOUR COLUMN RADIATORS.

LIST OF SIZES.

No. of Sections	Length	TAPPING			44 Inches High	38 Inches High	32 Inches High	26 Inches High	22 Inches High	18 Inches High
		One Pipe Steam	Two Pipe Steam	Water						
2	5	1	1 x $\frac{3}{4}$	1	18	16	13 $\frac{1}{2}$	10 $\frac{2}{3}$	8	6
3	7 $\frac{1}{2}$	1	1 x $\frac{3}{4}$	1	27	24	20	16	12	9
4	10	1	1 x $\frac{3}{4}$	1	36	32	26 $\frac{2}{3}$	21 $\frac{1}{3}$	16	12
5	12 $\frac{1}{2}$	1	1 x $\frac{3}{4}$	1	45	40	33 $\frac{1}{3}$	26 $\frac{2}{3}$	20	15
6	15	1	1 x $\frac{3}{4}$	1	54	48	40	32	24	18
7	17 $\frac{1}{2}$	1 $\frac{1}{4}$	1 x $\frac{3}{4}$	1	63	56	46 $\frac{2}{3}$	37 $\frac{1}{3}$	28	21
8	20	1 $\frac{1}{4}$	1 x $\frac{3}{4}$	1	72	64	53 $\frac{1}{3}$	42 $\frac{2}{3}$	32	24
9	22 $\frac{1}{2}$	1 $\frac{1}{4}$	1 x $\frac{3}{4}$	1	81	72	60	48	36	27
10	25	1 $\frac{1}{4}$	1 x $\frac{3}{4}$	1	90	80	66 $\frac{2}{3}$	53 $\frac{1}{3}$	40	30
11	27 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	99	88	73 $\frac{1}{3}$	58 $\frac{2}{3}$	44	33
12	30	1 $\frac{1}{4}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	108	96	80	64	48	36
13	32 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$ x1	1 $\frac{1}{4}$	117	104	86 $\frac{2}{3}$	69 $\frac{1}{3}$	52	39
14	35	1 $\frac{1}{4}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	126	112	93 $\frac{1}{3}$	74 $\frac{2}{3}$	56	42
15	37 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	135	120	100	80	60	45
16	40	1 $\frac{1}{2}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	144	128	106 $\frac{2}{3}$	85 $\frac{1}{3}$	64	48
17	42 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	153	136	113 $\frac{1}{3}$	90 $\frac{2}{3}$	68	51
18	45	1 $\frac{1}{2}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	162	144	120	96	72	54
19	47 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$ x1	1 $\frac{1}{4}$	171	152	126 $\frac{2}{3}$	101 $\frac{1}{3}$	76	57
20	50	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{4}$	180	160	133 $\frac{1}{3}$	106 $\frac{2}{3}$	80	60
21	52 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	189	168	140	112	84	63
22	55	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	198	176	146 $\frac{2}{3}$	117 $\frac{1}{3}$	88	66
23	57 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	207	184	153 $\frac{1}{3}$	122 $\frac{2}{3}$	92	69
24	60	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	216	192	160	128	96	72
25	62 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	225	200	166 $\frac{2}{3}$	133 $\frac{1}{3}$	100	75
26	65	1 $\frac{1}{2}$	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	234	208	173 $\frac{1}{3}$	138 $\frac{2}{3}$	104	78
27	67 $\frac{1}{2}$	2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	243	216	180	144	108	81
28	70	2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	252	224	186 $\frac{2}{3}$	149 $\frac{1}{3}$	112	84
29	72 $\frac{1}{2}$	2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	261	232	193 $\frac{1}{3}$	154 $\frac{2}{3}$	116	87
30	75	2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	270	240	200	160	120	90
31	77 $\frac{1}{2}$	2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	279	248	206 $\frac{2}{3}$	165 $\frac{1}{3}$	124	93
32	80	2	1 $\frac{1}{2}$ x1 $\frac{1}{4}$	1 $\frac{1}{2}$	288	256	213 $\frac{1}{3}$	170 $\frac{2}{3}$	128	96

Each section is 12 inches over all. Height from center of opening to floor is 5 inches. Always state whether for steam or water, and if for steam, whether one pipe or two pipe system.

NIAGARA DINING ROOM RADIATORS.

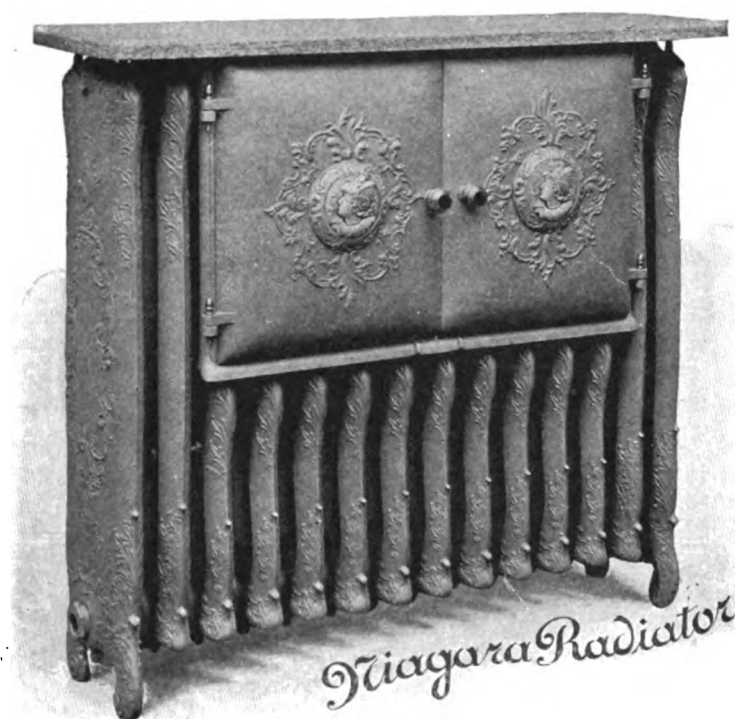


Plate 516.

DINING ROOM RADIATOR.

	Square feet of surface	Steam	Water
No. 1	54 feet.	\$53 00	\$61 00
No. 2	68 feet.	58 00	66 00
No. 3	82 feet.	63 00	71 00
No. 4	96 feet.	68 00	76 00
No. 5	110 feet.	73 00	81 00
No. 6	124 feet.	78 00	86 00

Prices include marble slab 13 inches wide.

DIXON'S RADIATOR SHIELDS.



They can be attached in a few seconds, and can be removed in an instant. They maintain cleanliness and are low in price. No Radiator is complete without one. They can be used on any style of Radiator. They allow free access to Radiator Valve and Air Vent. Where Radiators are placed in front of marble or glass which is to be protected from the heat, we can furnish Shields which extend down to the bottom of the Radiators.

Plate 517.

FOR RADIATORS WHICH MEASURE 3 INCHES CENTER TO CENTER OF LOOPS OR SECTIONS.

Number of Loops or Sections	Length of Shields in Inches	No. 1. Sheet Steel with Cast Iron Brackets	No. 2. Russia Iron with Cast Iron Brackets	No. 3. Russia Iron with Cast Iron Brackets and Brass Rail	No. 4. Polished Brass with Electro Bronze Brackets	No. 5. Sheet Copper, Nickel-plated and Polished with N. P. Brackets
3 and 4	13	\$2 20	\$ 3 25	\$ 3 75	\$ 5 70	\$ 6 45
5	16	2 45	3 70	4 30	6 40	7 35
6	19	2 75	4 25	5 00	7 20	8 45
7	22	3 05	4 75	5 65	8 00	9 50
8	25	3 35	5 30	6 40	8 80	10 60
9	28	3 65	5 85	7 10	9 60	11 65
10	31	3 95	6 40	7 75	10 45	12 75
11	34	4 25	6 95	8 40	11 25	13 85
12	37	4 55	7 45	9 10	12 05	14 90
13	40	4 85	8 00	9 80	12 85	16 00
14	43	5 20	8 55	10 45	13 65	17 05
15	46	5 50	9 10	11 15	14 50	18 15
16	49	5 80	9 65	11 85	15 30	19 25
17	52	6 10	10 15	12 55	16 15	20 30
18	55	6 50	10 80	13 30	17 15	21 40
19	58	6 85	11 40	14 00	18 10	22 60
20	61	7 20	12 05	14 70	19 00	23 70
21	64	7 65	12 65	15 40	19 95	24 95
22	67	8 05	13 35	16 15	.....	26 15
23	70	8 50	14 00	17 35	.....	27 55
24	73	8 95	14 65	17 60	.....	28 75
25	76	9 40	15 35	18 30	.....	30 00
3 to 5	13½	2 20	3 25	3 75	5 70	6 45
6	16	2 45	3 70	4 30	6 40	7 35
7	18½	2 70	4 15	4 90	7 05	8 25
8	21	2 95	4 60	5 45	7 75	9 15
9	23½	3 20	5 05	6 05	8 40	10 05
10	26	3 45	5 50	6 60	9 10	10 95
11	28½	3 70	5 95	7 15	9 75	11 85
12	32	3 95	6 40	7 75	10 45	12 75
13	33½	4 20	6 85	8 30	11 10	13 65
14	36	4 45	7 30	8 90	11 80	14 55
15	38½	4 75	7 75	9 45	12 45	15 45
16	41	5 00	8 20	10 00	13 15	16 35
17	43½	5 25	8 65	10 60	13 80	17 25
18	46	5 50	9 10	11 15	14 50	18 15
19	48½	5 75	9 55	11 75	15 15	19 05
20	51	6 00	10 00	12 30	15 90	19 95
21	53½	6 30	10 50	12 90	16 65	20 85
22	56	6 60	11 00	13 50	17 40	21 75
23	58½	6 90	11 50	14 10	18 25	22 80
24	61	7 20	12 05	14 70	19 00	23 70
25	63½	7 50	12 55	15 30	19 80	24 75
26	66	7 90	13 05	15 90	.....	25 80
27	68½	8 25	13 60	16 50	.....	26 85
28	71	8 65	14 20	17 10	.....	27 90
29	73½	9 00	14 75	17 70	.....	28 95
30	76	9 40	15 35	18 30	.....	30 00

NASON IMPROVED STEAM TRAP.

FOR TAKING OFF THE WATER OF CONDENSATION FROM STEAM PIPES, COILS AND APPARATUS
EMPLOYED IN STEAM HEATING AND EVAPORATING.

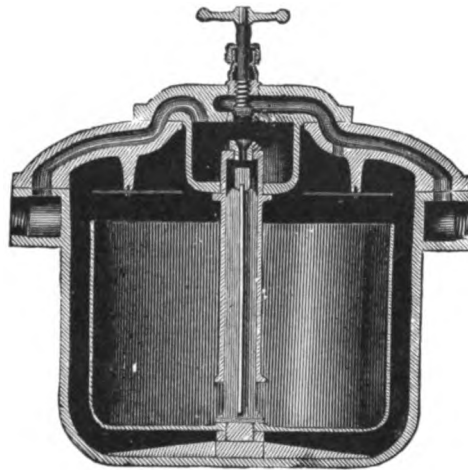


Plate 518.

Number of Steam Trap	1	2	3	4	5
Size of Pipe Connection	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Diameter outside of Flanges	$10\frac{3}{4}$	$14\frac{1}{4}$	$15\frac{3}{4}$	19	$24\frac{1}{4}$ in.
Diameter of Cylinder	8	$10\frac{1}{2}$	12	14	18 in.
Height to top of Valve	11	14	$16\frac{1}{4}$	$18\frac{1}{2}$	$23\frac{1}{2}$ in.
Height to top of Cover	8	10	12	14	$15\frac{1}{2}$ in.
Maximum discharge, pounds per minute	2	5	8	12	20
Greatest number of square feet of surface to which it should be applied	350	900	1400	2000	3500
Greatest number of lineal feet of 1 inch pipe surface to which it should be applied	1050	2700	4200	6000	10500
Price	\$16 00	22 00	27 50	42 50	70 00

The above table shows the number of square feet of heating surface in a common high-pressure steam heating apparatus, which steam traps of the several sizes may be expected to drain under ordinary exposure to cooling. For very low pressures, either a larger size should be used, or a steam trap should be specially ordered, with enlarged valve opening.

As a large assortment of the various sizes is kept on hand, orders will always be filled without delay.

NOTE.—When pressure in excess of 80 pounds is to be used, it should be so stated in the order so that the traps may be properly adjusted to it.

FIDELITY STEAM TRAP.

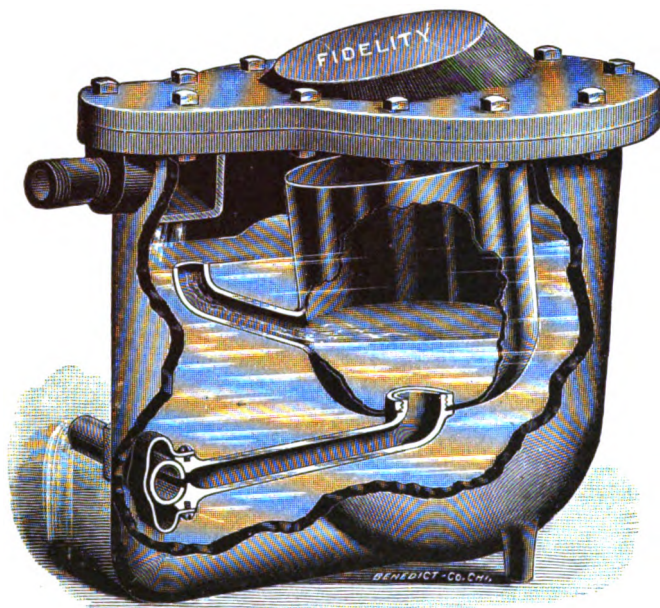


Plate 519.

PRICE LIST, SIZE AND CONDENSING CAPACITIES, BASED ON A PRESSURE OF 80 POUNDS.

No.	Lineal Feet 1 Inch Pipe Man'rs Rating	Lineal Feet 1 Inch Pipe Hot Blast Rating	Inlet	Outlet	Floor to Inlet	Floor to Outlet	Net Weight	Price
00	1,000	250	1 in.	$\frac{3}{4}$ in.	10 in.	3 in.	80 lbs.	\$22 00
0	2,000	500	1 in.	$\frac{3}{4}$ in.	10 in.	3 in.	80 lbs.	26 00
1	4,000	1,000	1 in.	$\frac{3}{4}$ in.	10 in.	3 in.	80 lbs.	30 00
2	7,000	1,750	$1\frac{1}{4}$ in.	1 in.	$11\frac{1}{2}$ in.	$3\frac{1}{4}$ in.	115 lbs.	40 00
3	10,000	2,500	$1\frac{1}{2}$ in.	$1\frac{1}{4}$ in.	12 in.	$3\frac{3}{4}$ in.	130 lbs.	55 00
4	15,000	4,000	2 in.	$1\frac{1}{2}$ in.	14 in.	4 in.	150 lbs.	75 00

State always the pressure under which you wish to use this Trap.

A. L. JONES' PATENT SELF-REGULATING STEAM TRAP.

NEW AND LATEST IMPROVED.

Over 100,000 of them in use.

No. 1.	\$35 00;	will drain	1,500 feet	1 Inch Pipe.
No. 2.	40 00;	will drain	3,000 feet	1 inch Pipe.
No. 3.	60 00;	will drain	7,000 feet	1 Inch Pipe.
No. 4.	75 00;	will drain	10,000 feet	1 Inch Pipe.



Plate 520.

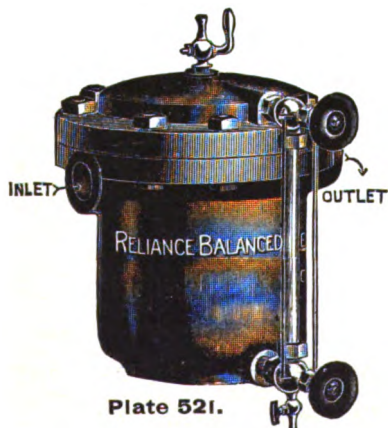
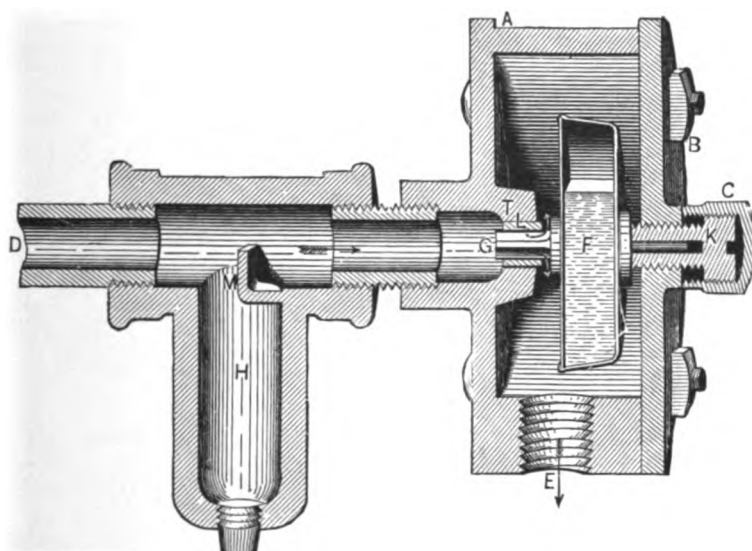


Plate 521.

RELIANCE BALANCED STEAM TRAPS.

Size	Capacity Feet of 1 Inch Iron Pipe	Price	Size of Inlet	Size of Outlet
No. 1	1,650	\$16 00	$\frac{3}{4}$ in.	$\frac{3}{4}$ in.
No. 2	5,000	25 00	1 in.	1 in.
No. 3	12,000	45 00	$1\frac{1}{4}$ in.	$1\frac{1}{4}$ in.
No. 4	24,000	60 00	2 in.	2 in.

HAWE'S STEAM TRAP.

- D Steam Connection.
 H Sediment Trap.
 G Valve.
 L Valve Seat.
 F Diaphragm.
 K Regulating Screw.
 C Lock Nut Cap.
 A Case.
 B Cover or Name Plate.
 E Outlet.

Plate 522.

No. 1	is tapped for $\frac{1}{2}$ inch Pipe; it drains	500 feet 1 inch Pipe, each	\$11 00
No. 2	is tapped for $\frac{3}{4}$ inch Pipe; it drains	1,000 feet 1 inch Pipe, each	16 00
No. 3	is tapped for 1 inch Pipe; it drains	2,000 feet 1 inch Pipe, each	21 00
No. 4	is tapped for $1\frac{1}{4}$ inch Pipe; it drains	4,000 feet 1 inch Pipe, each	26 00
No. $4\frac{1}{2}$, special,	for $1\frac{1}{4}$ inch Pipe; it drains	10,000 feet 1 inch Pipe, each	35 00
No. 5	is tapped for $1\frac{1}{2}$ inch Pipe; it drains	20,000 feet 1 inch Pipe, each	50 00
No. 0	is tapped for $\frac{1}{4}$ inch Pipe; for glue-pots and radiators		6 00

STEAM TRAP.**Plate 523.**

Size	12	15	18 in.
Price, each	\$23 00	36 00	54 00
Capacity, 1 inch Pipe, feet	1,500	3,500	5,000

KIELEY'S STANDARD STEAM TRAP.

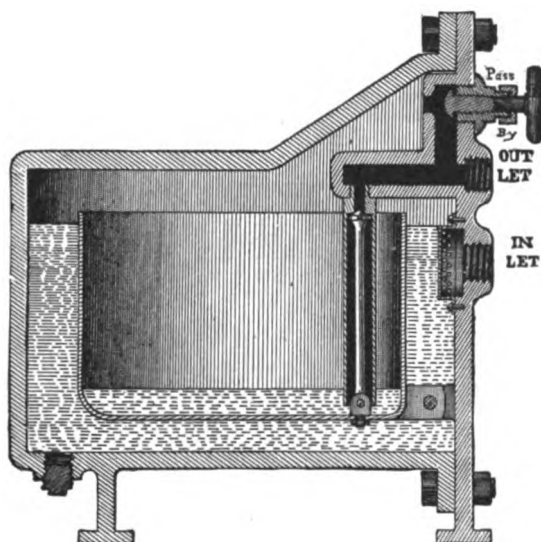


Plate 524.

For automatically draining the condensation from all kinds of steam apparatus, independent of returning it to the boiler.

The construction of this steam trap (as shown above) is such as to cause it to work satisfactorily under a pressure of from 10 to 150 pounds.

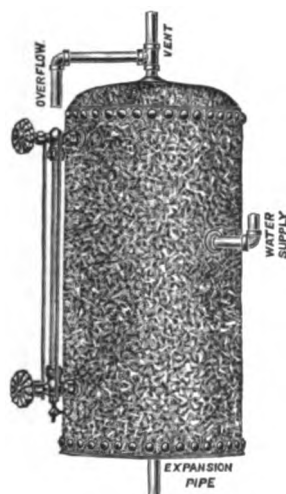
The float, being an open one, prevents all danger of it ever collapsing; and, being hinged to the cover, its power is increased to three or four times that of all open floats used in drain traps heretofore.

All working parts are fastened to the cover, to which are also connected the inlet and outlet pipes. The result is that by simply unbolting the body of the trap and moving it back all the working parts can be seen in exactly the same position as they are when the trap is working. The inlet and outlet pipes being connected to the cover only, admits of this trap being taken apart and cleaned without disconnecting a single pipe.

The pass-by, when open, will allow the air and water to pass out of or through the trap independent of the opening controlled by the float—which is of great advantage, outside of avoiding the otherwise necessary cost of a valve, pipe, fittings and labor in making a pass-by.

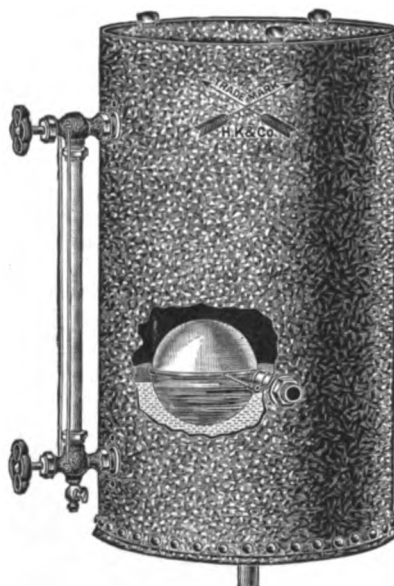
In ordering, if possible, state whether for high or low pressure.

Number	1	2	3	4	5
Inlet	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Outlet	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Number of lineal feet of 1 inch pipe Trap will					
drain	4,000	6,000	10,000	15,000	25,000
Each	\$25 00	35 00	45 00	60 00	80 00

GALVANIZED STEEL EXPANSION TANK.**Plate 525.**

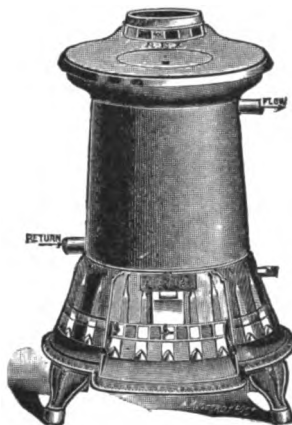
Capacity, 5½ gallons; Size, 9 inches by 20 inches	\$ 6 00
Capacity, 10 gallons; Size, 12 inches by 20 inches	8 00
Capacity, 12 gallons; Size, 12 inches by 24 inches	8 50
Capacity, 15 gallons; Size, 12 inches by 30 inches	9 00
Capacity, 18 gallons; Size, 12 inches by 36 inches	9 50
Capacity, 20 gallons; Size, 14 inches by 30 inches	12 50
Capacity, 24 gallons; Size, 14 inches by 36 inches	13 00
Capacity, 28 gallons; Size, 16 inches by 30 inches	14 00
Capacity, 32 gallons; Size, 16 inches by 36 inches	15 00
Capacity, 42 gallons; Size, 16 inches by 48 inches	16 50
Capacity, 66 gallons; Size, 18 inches by 60 inches	31 00
Capacity, 82 gallons; Size, 20 inches by 60 inches	37 00
Capacity, 100 gallons; Size, 22 inches by 60 inches	51 00
Capacity, 120 gallons; Size, 24 inches by 60 inches	58 00

Prices do not include water gauges or brasses.

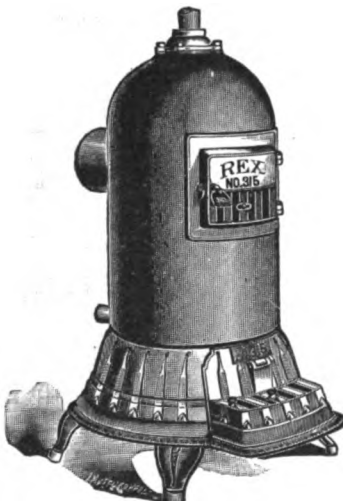
ANTI-WASTE EXPANSION TANK.**Plate 526.**

Capacity, 10 gallons; Size, 12 inches by 22 inches	\$ 11 00
Capacity, 15 gallons; Size, 12 inches by 34 inches	12 00
Capacity, 20 gallons; Size, 14 inches by 34 inches	16 00
Capacity, 25 gallons; Size, 16 inches by 28 inches	17 00
Capacity, 30 gallons; Size, 16 inches by 34 inches	18 00
Capacity, 40 gallons; Size, 16 inches by 46 inches	19 00
Capacity, 60 gallons; Size, 18 inches by 58 inches	33 00
Capacity, 80 gallons; Size, 20 inches by 58 inches	40 00
Capacity, 100 gallons; Size, 22 inches by 58 inches	54 00
Capacity, 120 gallons; Size, 24 inches by 58 inches	61 00
Capacity, 150 gallons; Size, 27 inches by 60 inches	74 00

Prices do not include water gauges or brasses. Other sizes made to order.

REX HOT WATER HEATERS.**SERIES 211-213-215.****Plate 527.**

Numbers	211	213	215
Diameter Grate, inches	11	13	15
Height, inches	33	35	37
Rad. Surface to Heat, square feet	75	110	160
Number Gallons Heat per Hour	100	140	200
Tapped Flow and Return	1½	1½	2
Diameter Smoke Pipe, inches	6	6	7
Price List	\$40 00	50 00	67 50

SERIES 313-315-317.**Plate 528.**

Numbers	313	315	317
Diameter Grate, inches	13	15	17
Height of Heater, inches	44	48	52
Rad. Surface to Heat, square feet	150	220	300
Number Gallons Heat per Hour	175	250	350
Tapped Flow and Return	2	2	½
Diameter Smoke Pipe, inches	6	7	7
Price List	\$68 00	82 00	100 00

WILKS HEATERS.

SMALL SIZES.

NOT SELF-FEEDERS.

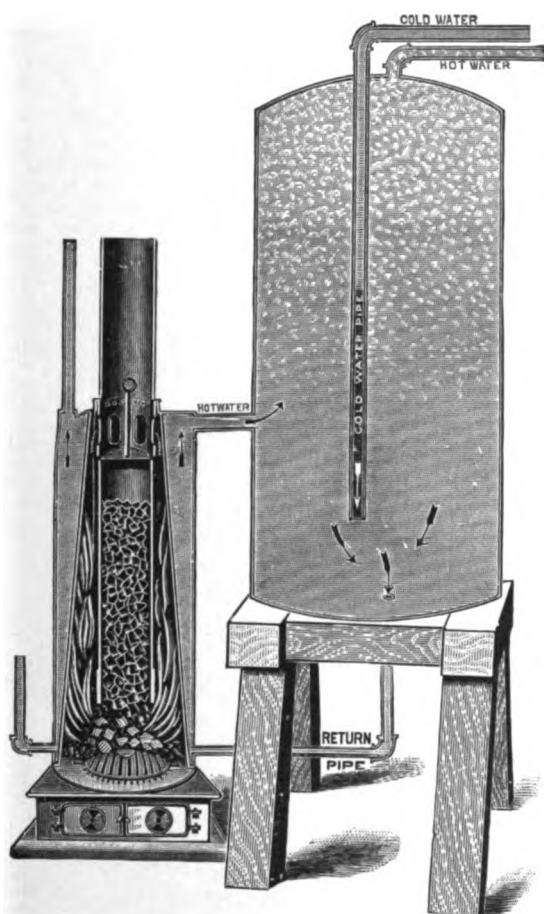


Plate 529.

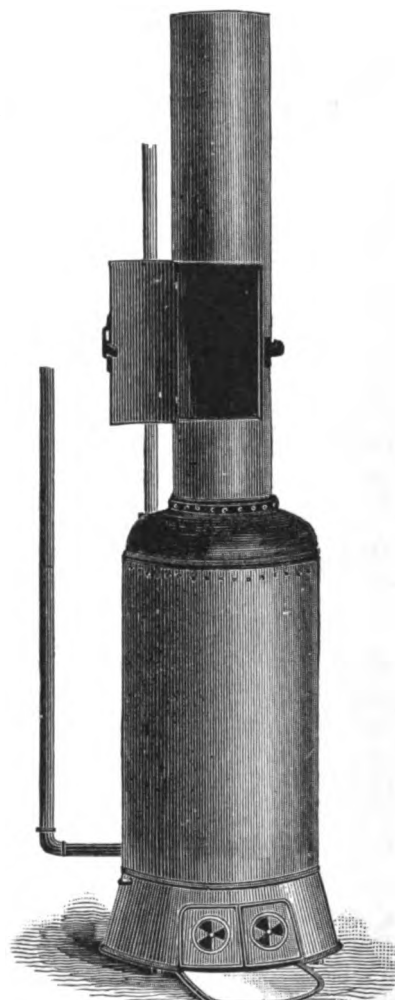


Plate 530.

Size of Furnace	Height from floor to top of Dome, inches	Size of Openings	Heating Surface, Square in.	Approximate Heating Power, 2 in. Pipe	Heating Capacity, Gals. per hour	Approximate Weight	Price
10 x 15	22¼	¾ in.	342	50 feet	30	70 lbs.	\$20 00
10 x 18	25¼	¾ in.	399	60 feet	40	75 lbs.	21 00
12 x 24	32¼	1 in.	648	100 feet	65	125 lbs.	25 00
12 x 30	38¼	1 in.	792	125 feet	75	155 lbs.	26 50
14 x 30	40½	1¼ in.	945	150 feet	100	185 lbs.	30 00
14 x 36	46¼	1¼ in.	1066	175 feet	125	205 lbs.	32 00

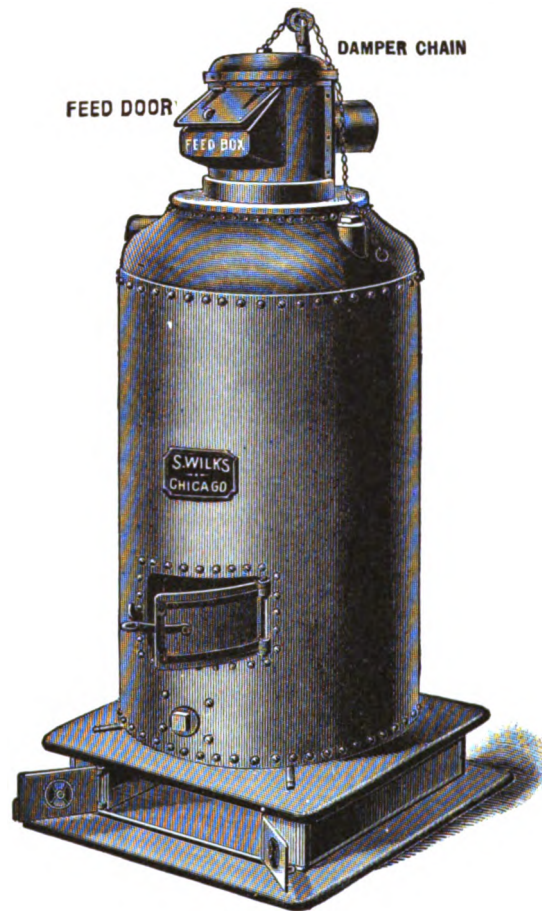
WILKS HEATERS.

Plate 531.

SELF-FEEDING SIZES.

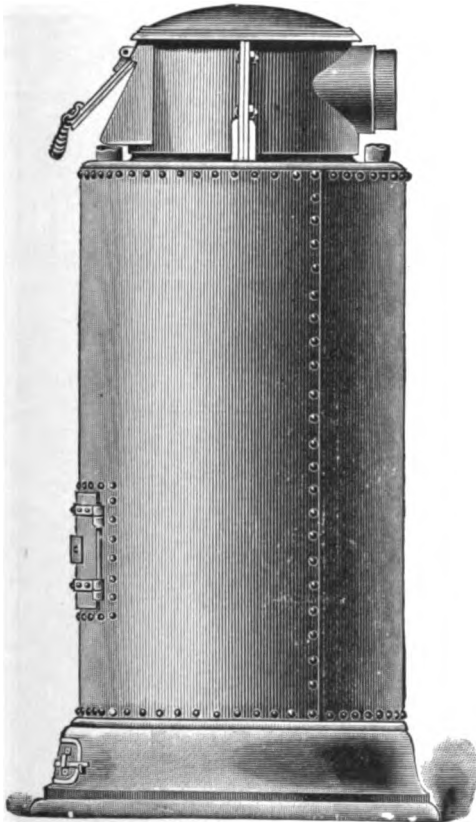
Size of Furnace, Inches	Height from Floor to top of Dome, Inches	Size of Openings, Inches	Heating Surface, Square Inches	Approximate Heating Power, 4 in. Pipe. Ft.	Heating Capacity, Gals. per Hour	Approximate Weight, Pounds	Price
16 x 30	41½	1½	1224	250	140	340	\$ 57 50
16 x 36	47½	1½	1435	300	150	380	60 00
20 x 30	43	2	1584	425	200	445	72 00
20 x 36	49	2	1720	450	250	500	75 00
20 x 42	55	2	2064	500	285	535	80 00
24 x 36	50	2	2376	700	300	715	105 00
24 x 42	56	2	2548	1000	325	740	110 00
30 x 42	57	3	3536	1200	650	1230	130 00
30 x 48	63	3	4002	1250	700	1280	135 00
36 x 42	60	3	4105	1450	900	1950	175 00
36 x 48	66	3	4588	1550	1000	2000	195 00
42 x 42	63	3	5356	2000	1200	2600	215 00
42 x 48	69	3	5928	2400	1300	2700	225 00

NOTE.—For direct radiation each square foot of radiating surface will heat from 20 to 40 cubic feet of space dependent on the conditions as to exposure, etc.

TABASCO WATER HEATER

AS ARRANGED FOR HEATING WATER FOR BATH ROOMS, LAUNDRIES,
HOTELS, FLATS, ETC.

SIDE VIEW.

**Plate 532.**

FOR HEATING WATER FOR BATH ROOMS, LAUNDRIES,
HOTELS, FLATS, ETC.

No. of Heater	Size of Heater, Inches	Heating Capacity Gallons per hour	Total Height, Inches	Sizes Flows and Returns	Weight	Price of Heater
17	17x30	120	48	1½	350	\$ 55 00
18	17x36	150	54	1½	400	58 00
21	21x30	200	57	2	500	65 00
22	21x36	250	57	2	535	70 00
23	21x42	300	63	2	570	75 00
24	21x48	350	69	2	600	80 00
25	25x36	300	57	2	670	100 00
26	25x42	350	63	2	725	105 00
27	25x48	400	69	2	775	110 00
30	30x42	500	67	3	1100	120 00
31	30x48	600	73	3	1180	125 00
32	30x54	700	79	3	1250	130 00

FOR HEATING BUILDINGS USING RADIATORS.

No. of Heater	Size of Heater, Inches	Heating Capacity, Square Feet, Direct Radiation	Total Height	Size Flows and Returns	Weight	Price of Heater
171	17 x 30	200	48	1½	350	\$ 55 00
172	17 x 36	250	54	1½	400	58 00
210	21 x 30	300	51	2	500	65 00
211	21 x 36	350	57	2	535	70 00
212	21 x 42	400	63	2	570	75 00
213	21 x 48	450	69	2	600	80 00
250	25 x 36	450	57	2	670	100 00
251	25 x 42	500	63	2	725	105 00
252	25 x 48	550	69	2	775	110 00
300	30 x 42	600	67	3	1100	120 00
301	30 x 48	700	73	3	1180	125 00
302	30 x 54	800	79	3	1250	130 00

THE WINCHESTER BOILER.

FOR STEAM.

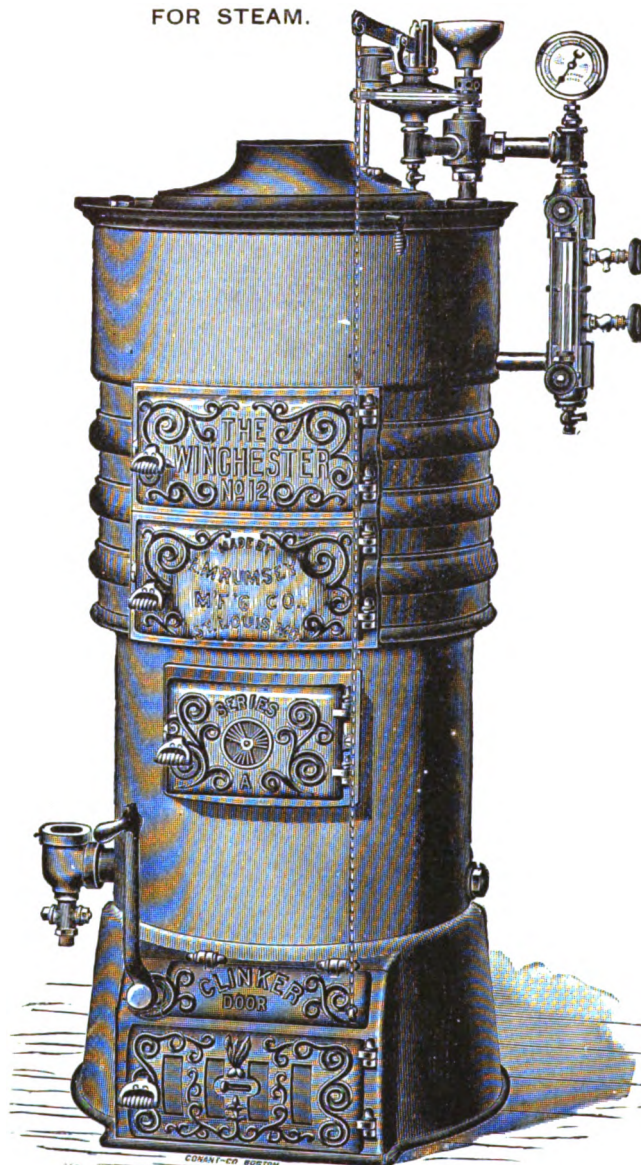


Plate 533.

THE WINCHESTER BOILER FOR STEAM—PORTABLE OR BRICK-SET STYLES.

Number	4	8	12	16	20	24	28
Diameter of Grate	16	16	18	21	24	27	30 in.
Extreme Height	50	60	60	62	62	64	64 in.
Height of Water Line	40	50	50	52	52	52	52 in.
Outside Diameter	24	24	26	29	32	35	38 in.
Number of Outlets	4	4	4	4	4	4	4
Size of Outlets	2	2	2	2	2½	3	3 in.
Size Return Inlets	1¼	1¼	1½	1½	2	2	2 in.
Diameter Smoke Pipe	6	6	7	8	8	9	9 in.
Number Brick Required.	400	500	550	650	750	850	1000
Capacity	140	180	225	350	500	650	850
Shipping Weight	875	1050	1150	1475	1700	2000	2350
Each	\$100 00	120 00	160 00	210 00	250 00	290 00	340 00

NOTICE.—The above prices include trimmings and firing tools. Ratings are for direct radiation, with pipes uncovered.

THE WINCHESTER BOILER.

FOR HOT WATER.

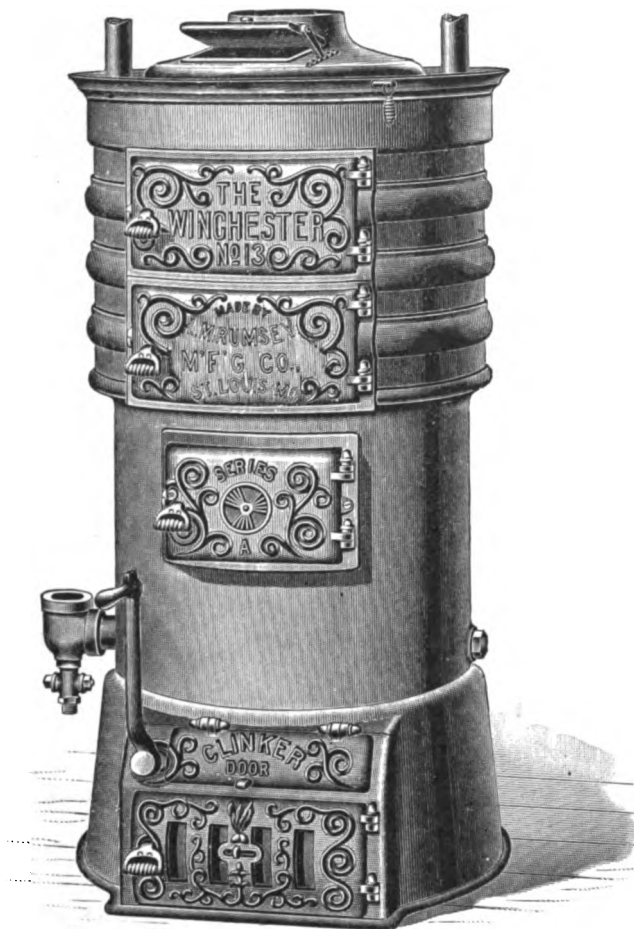


Plate 534.

THE WINCHESTER BOILER FOR HOT WATER—PORTABLE OR BRICK-SET STYLES.

Number	3	5	9	17	21	25	29
Diameter of Grate	16	16	18	21	24	27	30 in.
Extreme Height	45	54	54	56	56	58	58 in.
Outside Diameter	24	24	26	29	32	35	38 in.
Number of Outlets	4	4	4	4	4	4	4
Size of Outlets	2	2	2	2½	2½	3	3 in.
Number Return Inlets	3	3	3	3	3	3	3
Size of Return Inlets	2	2	2	2½	2½	3	3 in.
Diameter of Smoke Pipe	6	6	7	8	8	9	9 in.
Number of Bricks Required	400	500	550	650	750	850	1000
Capacity	225	300	400	525	750	1000	1350
Shipping Weight	750	900	1050	1300	1400	1850	2050
Each	\$90 00	110 00	140 00	190 00	230 00	270 00	320 00

NOTICE.—The above prices include firing tools. Ratings are for direct radiation, with pipes uncovered.

THE POWERS AUTOMATIC TEMPERATURE REGULATOR.

Saves fuel and labor. Can be applied to any heating apparatus.

No. 1, Limiting device for control of Hot Water Tank Heater. Price as shown, \$25.00.

No. 2, Regulator used with thermostat for control of Hot Air Furnaces. Price complete with thermostat, \$40.00.

No. 4, Regulator used with thermostat for control of Hot Water Heaters. Price complete with thermostat, \$50.00.

No. 3, Regulator used with thermostat for control of Low Pressure Steam Heater. Price complete with thermostat, \$45.00.

No. 8, Regulator for control of Hot Water Tanks heated by steam.

No. 8, with 1 Inch Valve	\$ 70 00
No. 8, with 1½ Inch Valve	75 00
No. 8, with 1¾ Inch Valve	80 00
No. 8, with 2 Inch Valve	90 00

Send for complete catalogue of the Powers Regulators.

THERMOSTAT.

No. 0.



Plate 535.

No. 1



Plate 536.

No. 4.

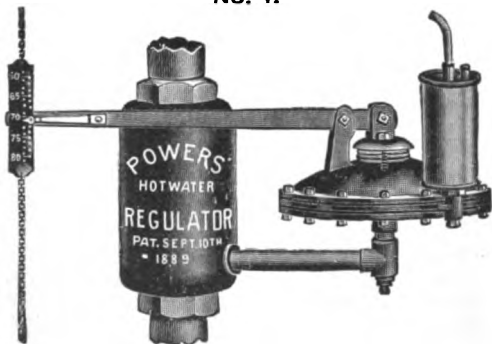


Plate 538.

No. 2.

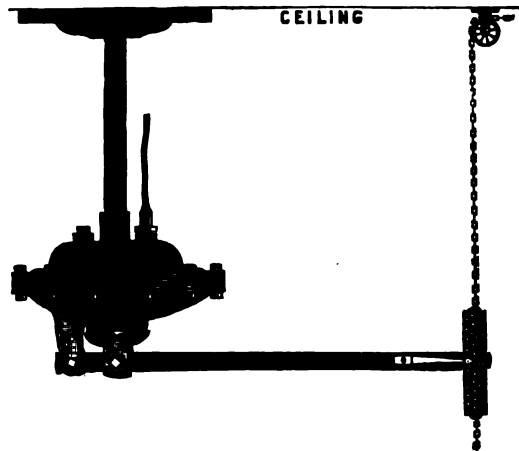


Plate 537.

No. 3.

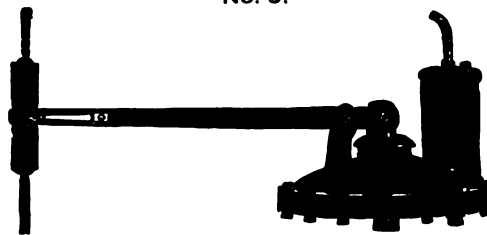


Plate 539.

No. 8.

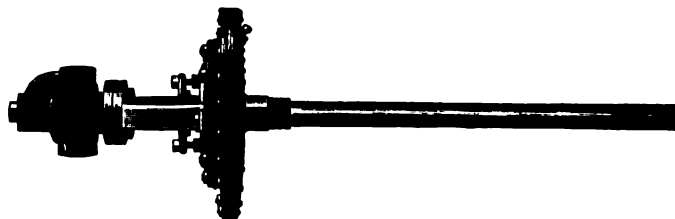


Plate 540.

THE CRESCENT THERMOMETERS.

ESPECIALLY ADAPTED FOR HOT WATER AND STEAM HEATED PLANTS.



Plate 541.

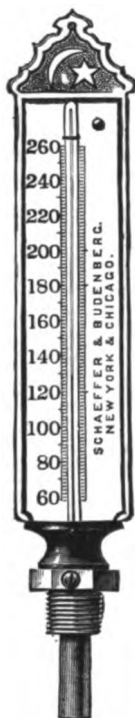


Plate 542.

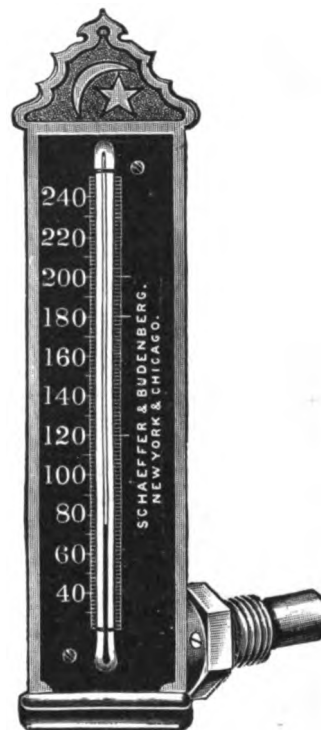


Plate 543.

These instruments have been specially designed for the above purposes and have been applied with great success.

They are made with either white silvered or black metal dials, and are handsomely finished.

The cases are made detachable, so that the lower part forming the mercury bath can remain in apparatus while the upper part can be removed if this should become necessary for repairs.

The steam heater thermometer is provided with temperature and pressure scales.

Plate 542—The Straight Crescent Thermometer, for Hot Water, per doz \$36 00

Plate 541—The Straight Crescent Thermometer, for Steam, with Pressure Scale, per doz. 39 00

Plate 543—The Angle Crescent Thermometer, for Hot Water, per doz 42 00

MINERAL WOOL SECTIONAL COVERING.

FOR STEAM PIPES AND BOILERS.

BEST NON-CONDUCTOR FOR ALL HEATED SURFACES, STEAM OR FIRE HEAT.

PIPE COVERING.

Made in Sections three feet long, to fit any size Pipe.

This cut represents one section applied and closed on the pipe, and the other section open, but about to be closed by folding and pasting down the lap.



Plate 544.

It is absolutely indestructible by heat. It will not char like wool, powder like hair, nor crack like cement, nor burn like paper. It is easily and quickly applied and removed by any one. It is endorsed by insurance companies.

BOILER COVERING.

Made in blocks $1\frac{1}{2}$ inches thick, of heavy asbestos sheathing and filled with Mineral Wool.

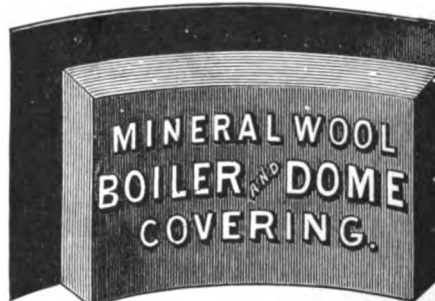


Plate 545.

PRICES PER FOOT IN LENGTH.

Size of Pipe, inside diameter	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12 in
Paper Casing	\$0 18	19	21	23	25	27	30	34	38	42	46	50	55	61	70	76	82	95
Canvas Covered	18	19	21	23	25	27	30	34	38	42	46	50	55	61	70	76	82	95
Asbestos Casing	18	19	21	23	25	27	30	34	38	42	46	50	55	61	70	76	82	95

For Boilers, Drums, etc., 35 cents per square foot.

W. B. PIPE COVERING.

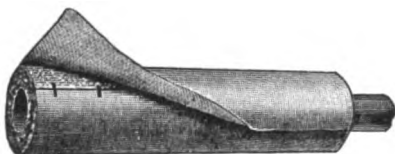


Plate 546.

Our W. B. pipe covering is the perfection of insulating protection for steam pipes and all heated surfaces. Nowadays it needs no extended argument to convince users of steam that it pays to protect steam pipes from the influences of the surrounding atmosphere. It is universally acknowledged and the only question to be settled is, which is best? There are no better non-conductors of heat known than asbestos and wool felt, and in our W. B. covering these have been combined producing the best results, there being consecutive layers of asbestos (about $\frac{1}{8}$ of an inch thick) about the pipe, outside of this the wool felt with a canvas cover or jacket. This covering is easily applied by the most unskilled workmen, is removable and lasts as long as the pipes themselves. Will not crack, crumble or fall away from the pipes when necessary staples are used in applying.

Size	Cov.	Ells.	Tees	Valves
$\frac{1}{2}$ to $\frac{3}{4}$ in.	\$0 20	25	27	25
1 to $1\frac{1}{4}$	23	25	30	27
$1\frac{1}{2}$	25	25	33	33
2	27	27	38	38
$2\frac{1}{2}$	30	30	43	43
3	34	34	49	49
$3\frac{1}{2}$	38	38	56	56
4	42	42	64	64
$4\frac{1}{2}$	46	46	72	72
5	50	50	80	80
6	58	58	90	90
7	65	65	1 00	1 00
8	72	72	1 10	1 10
9	80	80	1 20	1 20
10	89	89	1 35	1 35
12	1 00	1 00	1 50	1 50

ASBESTOS MOULDED COVERING.

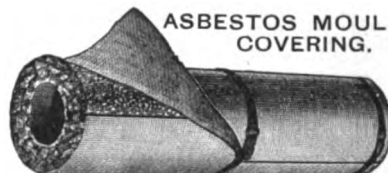


Plate 547.



Plate 548.

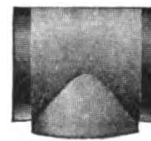


Plate 549.

This covering is made of asbestos fibre and other light non-conductive materials. It is very strong; is absolutely fire-proof and is adapted for highest steam pressure. It will not crack and is made to fit pipes of all diameters from one-half inch upward. The fittings are furnished of the same materials and fit perfectly.

It can be easily applied to hot or cold pipes by any practical man. We always send with this covering sufficient metal bands to securely fasten it to the pipes.

Size	Cov.	Ells.	Tees	Valves
$\frac{1}{2}$ to $\frac{3}{4}$ in.	\$0 20	24	27	20
1 to $1\frac{1}{4}$	21	24	30	22
$1\frac{1}{2}$	23	24	33	24
2	26	27	36	27
$2\frac{1}{2}$	29	29	39	39
3	32	32	45	45
$3\frac{1}{2}$	35	35	50	50
4	38	38	55	55
$4\frac{1}{2}$	43	43	61	61
5	49	49	67	67
6	56	56	73	73
7	64	64	82	82
8	70	70	91	91
9	77	77	1 03	1 03
10	85	85	1 15	1 15
12	1 00	1 00	1 30	1 30

RANGE BOILER. COPPER.

LIGHT
OR HEAVY PRESSURE.

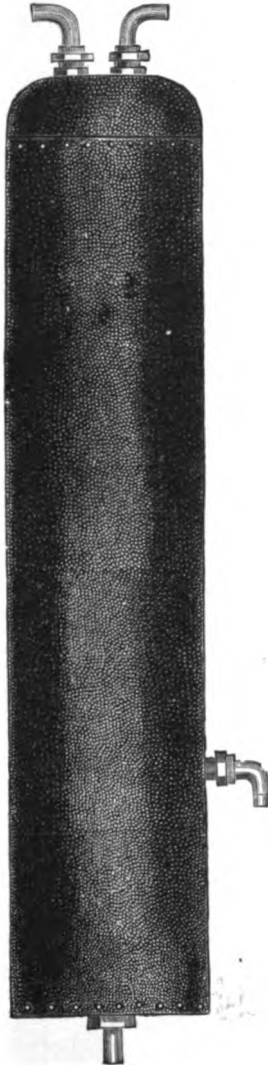


Plate 550.

RANGE BOILER. IRON.

GALVANIZED.

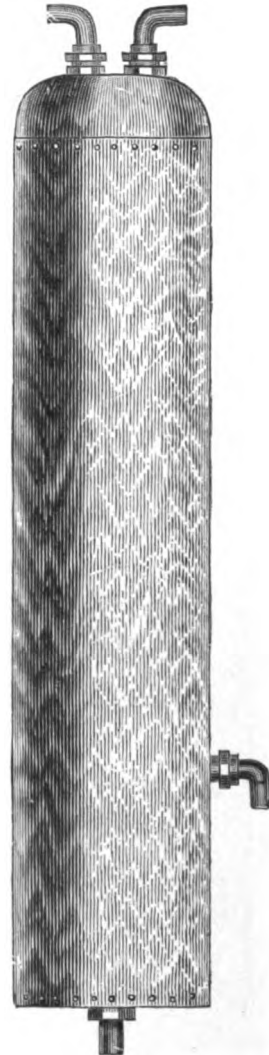


Plate 551.

GALVANIZED IRON RANGE BOILERS.

Capacity	SIZE,		Price, Galvanized
	Height	Diameter	
18 gallons.	3 feet	by 12 inches.	\$ 14 50
21 gallons.	3½ feet	by 12 inches.	15 50
24 gallons.	4 feet	by 12 inches.	15 75
24 gallons.	3 feet	by 14 inches.	19 00
27 gallons.	4½ feet	by 12 inches.	18 50
28 gallons.	3½ feet	by 14 inches.	20 25
30 gallons.	5 feet	by 12 inches.	19 00
32 gallons.	4 feet	by 14 inches.	21 00
35 gallons.	5 feet	by 13 inches.	21 00
36 gallons.	6 feet	by 12 inches.	24 50
36 gallons.	4½ feet	by 14 inches.	21 50
40 gallons.	5 feet	by 14 inches.	24 00
42 gallons.	4 feet	by 16 inches.	26 00
47 gallons.	4½ feet	by 16 inches.	30 00
48 gallons.	6 feet	by 14 inches.	30 00
52 gallons.	5 feet	by 16 inches.	31 00
53 gallons.	4 feet	by 18 inches.	31 50
63 gallons.	6 feet	by 16 inches.	38 00
66 gallons.	5 feet	by 18 inches.	38 00
79 gallons.	6 feet	by 18 inches.	44 00
82 gallons.	5 feet	by 20 inches.	45 50
98 gallons.	6 feet	by 20 inches.	61 50
100 gallons.	5 feet	by 22 inches.	63 50
120 gallons.	6 feet	by 22 inches.	74 00
120 gallons.	5 feet	by 24 inches.	72 50
144 gallons.	6 feet	by 24 inches.	103 00
168 gallons.	7 feet	by 24 inches.	120 00
192 gallons.	8 feet	by 24 inches.	132 00

COPPER RANGE BOILERS.

Number of gallons	30	35	40	45	50	60	70	80	90	100
Round Head, light	\$24 00	27 00	32 00	37 00	41 00	52 00	59 00	68 00	80 00	88 00
Round Head, heavy	26 00	30 00	34 00	39 00	43 00	55 00	63 00	72 00	84 00	92 00
Round Head, double weight . . . . .	.....	.....	.....	.....	.....	85 00	.....	100 00	.....	112 00
Boxing, net	1 25	1 50	1 50	1 75	1 75	2 00	2 00	2 00	2 00	2 00

All Couplings are for Lead Pipe connection, unless otherwise ordered. Couplings threaded for ¼ or ¾ Iron Pipe furnished if desired.

GALVANIZED RANGE BOILERS.

VERTICAL WITH COPPER
STEAM COIL INSIDE.

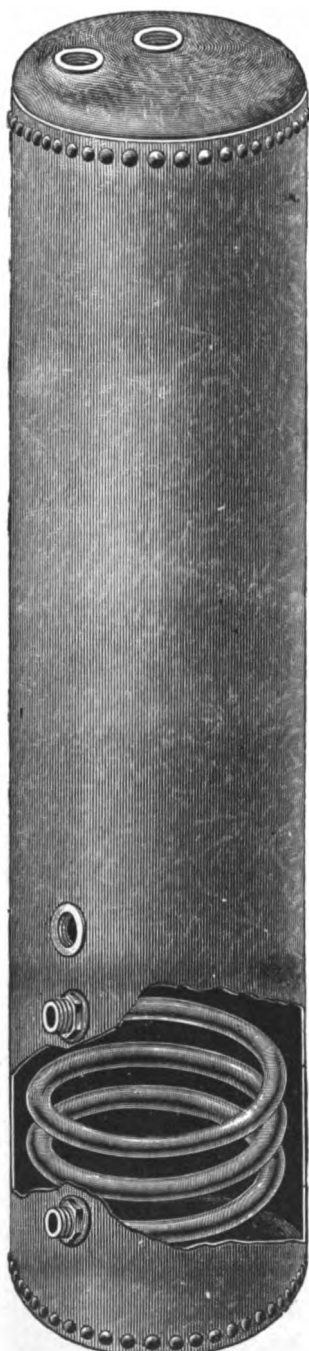


Plate 552.

BOILER STAND.

Height 21 inches.

	Plain	Galvan- ized
12 in. Ring	\$1 25	2 50
13 in. Ring	1 30	2 60
14 in. Ring	1 40	2 70
15 in. Ring	1 50	3 00
16 in. Ring	1 75	3 25
17 in. Ring	1 85	3 60
18 in. Ring	2 00	3 80
20 in. Ring	2 25	4 50
22 in. Ring	2 75	5 00
24 in. Ring	3 50	6 50



Plate 553.

YOUNG'S ADJUST- ABLE BOILER STAND.

	Plain	Galvan- ized
12 in. Ring	\$1 25	2 50
13 in. Ring	1 30	2 60
14 in. Ring	1 40	2 70
15 in. Ring	1 50	3 00
16 in. Ring	1 75	3 25
17 in. Ring	1 85	3 60
18 in. Ring	2 00	3 80
20 in. Ring	2 25	4 50
22 in. Ring	2 75	5 00
24 in. Ring	3 50	6 50

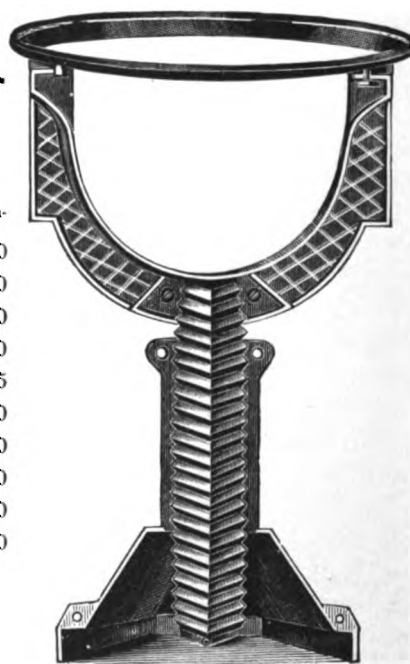
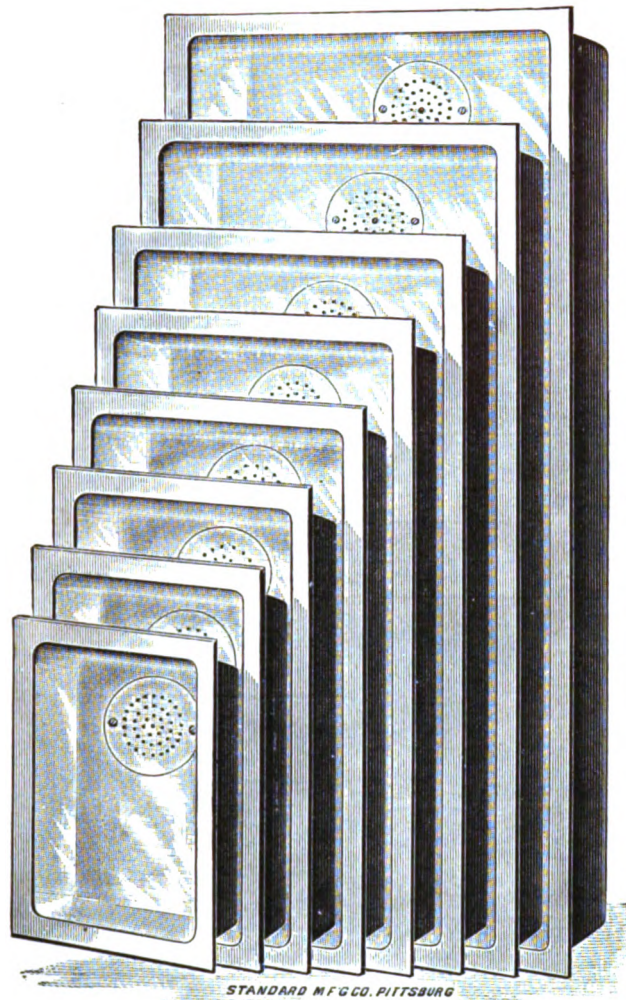


Plate 554.

GALVANIZED RANGE BOILERS VERTICAL—WITH COPPER STEAM COIL INSIDE.

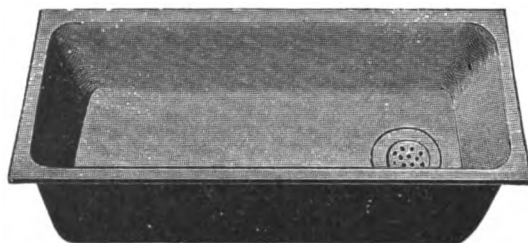
We furnish these Boilers with Copper Coil inside to heat the water by steam. The pressure of steam, size of Boiler and quantity of hot water required, determines the number of feet of heating coil needed. therefore, the cost varies so much that no price can be attached. When ordering, always state the number of pounds of steam pressure to be used on Coil. Price on application.

SQUARE KITCHEN SINKS.**Plate 555.**

Size	Plain	Galvan- ized	White or Gray Enameled	Size	Plain	Galvan- ized	White or Gray Enameled
16 x 12, 6 deep . . .	\$1 10	\$2 30	\$4 50	30 x 18, 6 deep . .	\$ 2 50	\$ 5 10	\$ 8 50
18 x 12, 6 deep . . .	1 25	2 60	4 75	30 x 20, 6 deep . .	3 00	6 25	9 00
20 x 14, 6 deep . . .	1 50	3 20	6 00	32 x 18, 6 deep . .	3 00	6 25	9 50
20 x 16, 6 deep . . .	1 60	3 50	6 25	32 x 21, 6 deep . .	3 40	7 20	9 75
22 x 14, 6 deep . . .	1 60	3 30	6 00	36 x 18, 6 deep . .	3 00	6 50	9 50
23 x 15, 6 deep . . .	1 70	3 75	6 25	36 x 20, 6 deep . .	3 70	7 75	10 50
24 x 14, 6 deep . . .	1 70	3 75	6 25	38 x 20, 6 deep . .	3 80	8 00	11 00
24 x 16, 6 deep . . .	1 80	4 00	6 50	40 x 20, 6 deep . .	4 25	9 00	12 00
24 x 18, 6 deep . . .	2 10	4 30	7 00	40 x 22, 6 deep . .	4 25	9 00	12 00
24 x 20, 6 deep . . .	2 40	5 00	7 50	42 x 22, 6 deep . .	4 25	9 00	12 00
27 x 15, 6 deep . . .	2 00	4 25	7 25	48 x 20, 6 deep . .	5 30	11 50	13 25
28 x 16, 6 deep . . .	2 10	4 50	7 50	48 x 23, 6 deep . .	5 75	12 50	15 50
28 x 17, 6 deep . . .	2 20	4 50	7 50	50 x 24, 6 deep . .	7 50	16 00	18 00
28 x 20, 6 deep . . .	2 70	5 50	8 00	59 x 20, 6 deep . .	10 00	21 00	25 00
30 x 16, 6 deep . . .	2 25	4 75	7 75				

Patent Overflow Sinks, add to above price, \$1.00.

Patent Overflow Sinks, with Plug Strainers, add to above price list, \$1.50.

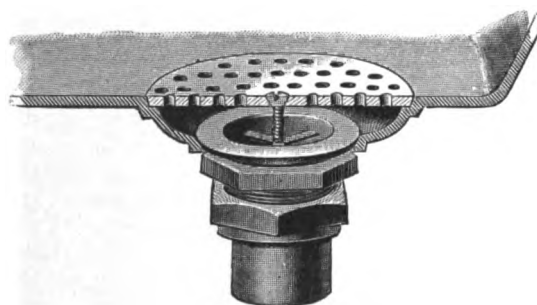
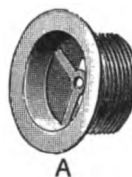
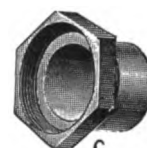
SQUARE STEEL SINK.**Plate 556.**

Size	Painted	Galvanized	Gray Enameled	White Enameled
16 x 24 x 6, each	\$1 80	4 00	6 50	7 50
18 x 30 x 6, each	2 50	5 10	8 50	10 00
18 x 36 x 6, each	3 00	6 50	9 50	11 00
20 x 30 x 6, each	3 00	6 25	9 00	10 50
20 x 36 x 6, each	3 70	7 75	10 50	12 00
20 x 40 x 6, each	4 00	8 50	11 50	13 00

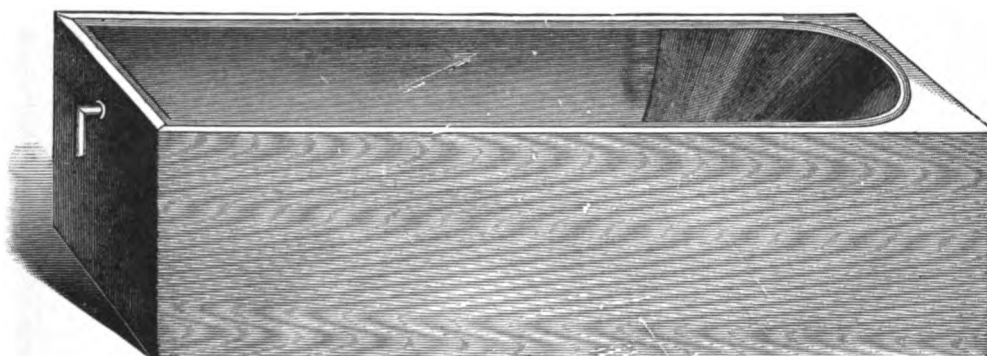
OVAL STEEL SINK.**Plate 557.**

Size	14 x 20 in.
Painted	\$2 00
Galvanized	3 50
Gray Enameled	5 50
White Enameled	6 50

If fitted with Plug, add \$1.00 to list. Oval Sinks, with Patent Overflow, 50 cents extra.

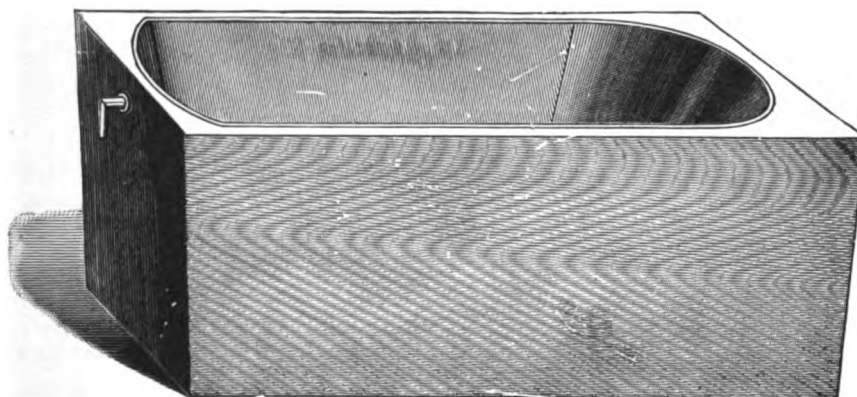
COUPLINGS FOR STEEL SINKS.**Plate 558.****A****B****C****Plate 559. Plate 560. Plate 561.**

Brass Couplings, complete with Strainer	\$0 60
Brass Couplings, complete with Plug	1 00
Brass Overflow Couplings, for Oval Sinks	60
Steel Strainers, Plain	10
Steel Strainers, Enameled	25
Screws	05

COPPER BATH TUBS.**NEW YORK PATTERN.****Plate 562.**

Size, 5 feet, 5 feet 6 inches, or 6 feet long, 24 inches wide and 19½ deep, outside measure.

Weight of Copper to square foot	10	12	14	16	18	20 oz.
Each	\$15 00	16 00	18 00	20 00	22 00	24 00

FRENCH PATTERN.**Plate 563.**

26 inches wide at top, 23 inches wide at bottom, 22 inches deep, outside measure.

Weight of Copper to square foot	10	12	14	16	18	20 oz.
4½ feet long	\$16 00	17 00	19 00	21 00	23 00	25 00
5 feet long	18 00	19 00	21 00	23 00	25 00	27 00
5½ feet long	20 00	21 00	23 00	25 00	27 00	29 00
6 feet long	22 00	23 00	25 00	27 00	29 00	31 00

ZINC BATH TUBS.

Size, 5, 5½ or 6 feet long, each \$8 00

We can fit any of the above Tubs with Rubber Plug and Socket, Overflow and Connections for Iron Pipe at an additional cost of \$5.00 net.

N. B.—Oak, Cherry or Walnut Cases for any of the Tubs shown above made to order.

RUMSEY'S STEEL-CLAD BATH, No. 2.

FRENCH PATTERN.

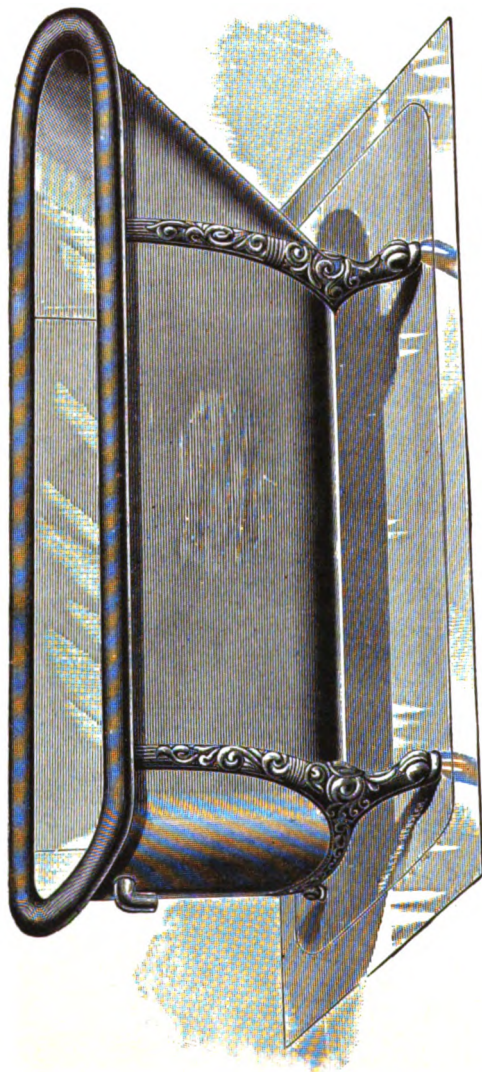


Plate 564.

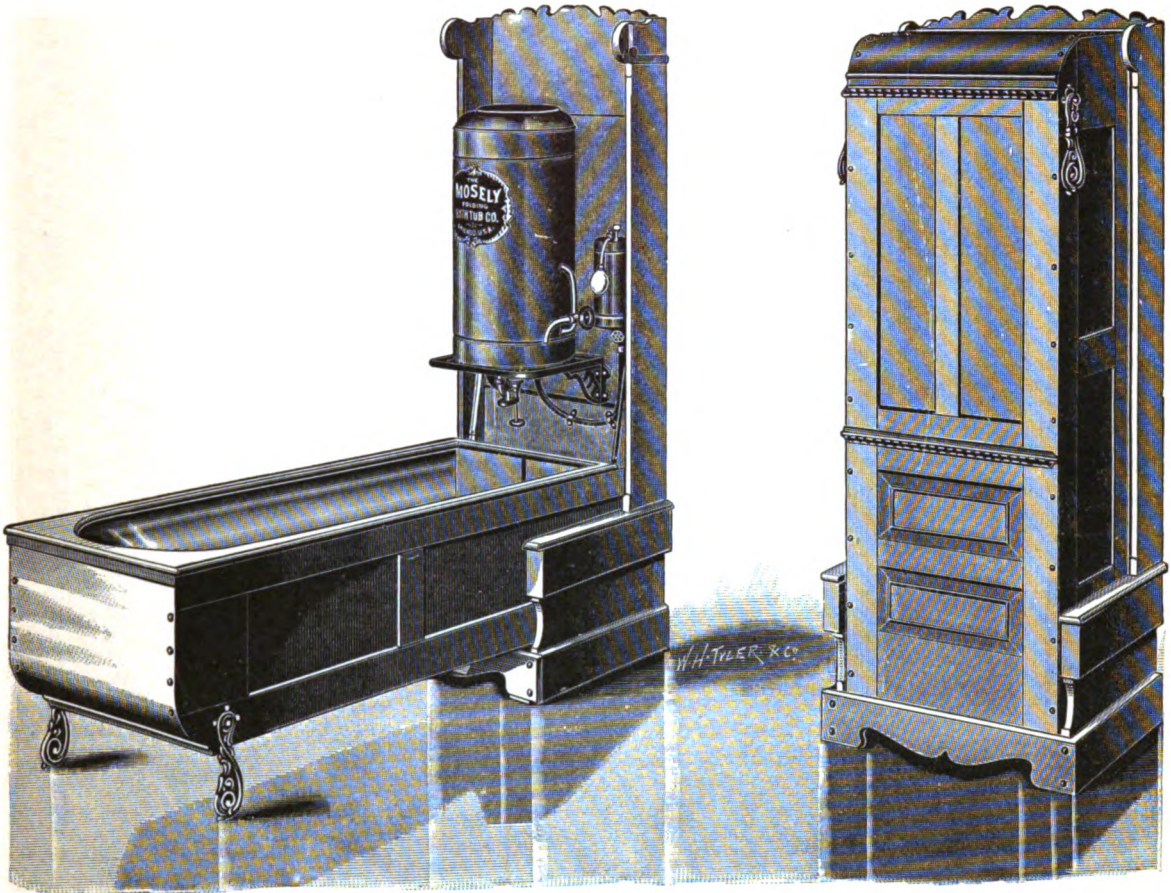
Fitted for No. 4½ Fuller Combination Bath Cock unless otherwise ordered, and with Cherry or Oak Polished Wood Rim. The exterior is finished a light Gray and the tub supported on Ornamental Gold-bronzed Legs.

Dimensions: Width outside of Rim, 28 inches; depth, 17½ inches; from Floor to top of Rim, 23¾ inches.

Size	No. 38.	No. 40.	No. 42.
	4 ft. 6 in.	5 ft.	5 ft. 6 in.
Weight of Copper	12 oz.	12 oz.	12 oz.
Price	\$23 00	24 00	25 00

A 5 ft. Steel-Clad Bath is equal in length to a 5½ ft. ordinary Bath Tub.

Order by Number.

MOSELY FOLDING BATH TUB.**THE SOUTHERN.****Plate 565.**

These Tubs may be used without Heater, and connected with regular Hot and Cold Water Systems.

For full description of Attachments and Fittings, and other styles and prices,
send for full illustrated catalogue of Folding Bath Tubs.

French Pattern, 5 feet long; American Pattern, 5 feet 6 inches; 22 inches wide and 17 inches deep.

Polished Natural or Antique Ash wood.

No. 12¾, with No. 9 Zinc Lining and Heater	\$44 00
No. 12¾, with No. 9 Zinc Lining, without Heater	27 00
No. 27¾, with 14 oz. Planished and Tinned Copper Lining and Heater	52 50
No. 27¾, with 14 oz. Planished and Tinned Copper Lining, without Heater	35 50
If with White Enamel Lining, add	5 00
If with No. 500 Faucet, add	6 00

Furnished with Gas, Gasoline or Kerosene Burners.

RUMSEY'S STANDARD PORCELAIN ENAMELED BATH.

THE PERFECTO—WITH 2 INCH ROLL RIM.



Plate 566.

With No. 4½ Nickel-Plated Fuller Double Bath Cock, Brass Common Overflow Connection with Nickel-Plated Strainer, Waste Plug with Rubber Stopper.

DIMENSIONS: Width inside, 24 inches; depth inside, 17 inches; height from floor, 22 inches.

Price, as described, Enameled	4 ft.	4½ ft.	5 ft.	5½ ft.
Length over Rim	\$32 50	35 50	39 50	44 50
Length, including Fittings	4 ft. 4½ in.	4 ft. 10½ in.	5 ft. 4½ in.	5 ft. 10½ in.
	4 ft. 6½ in.	5 ft. ½ in.	5 ft. 6½ in.	6 ft. ½ in.

If with two Nickel-Plated Supply Pipes, add \$3.00.

RUMSEY'S STANDARD PORCELAIN ENAMELED BATH.

STANDARD PATTERN.

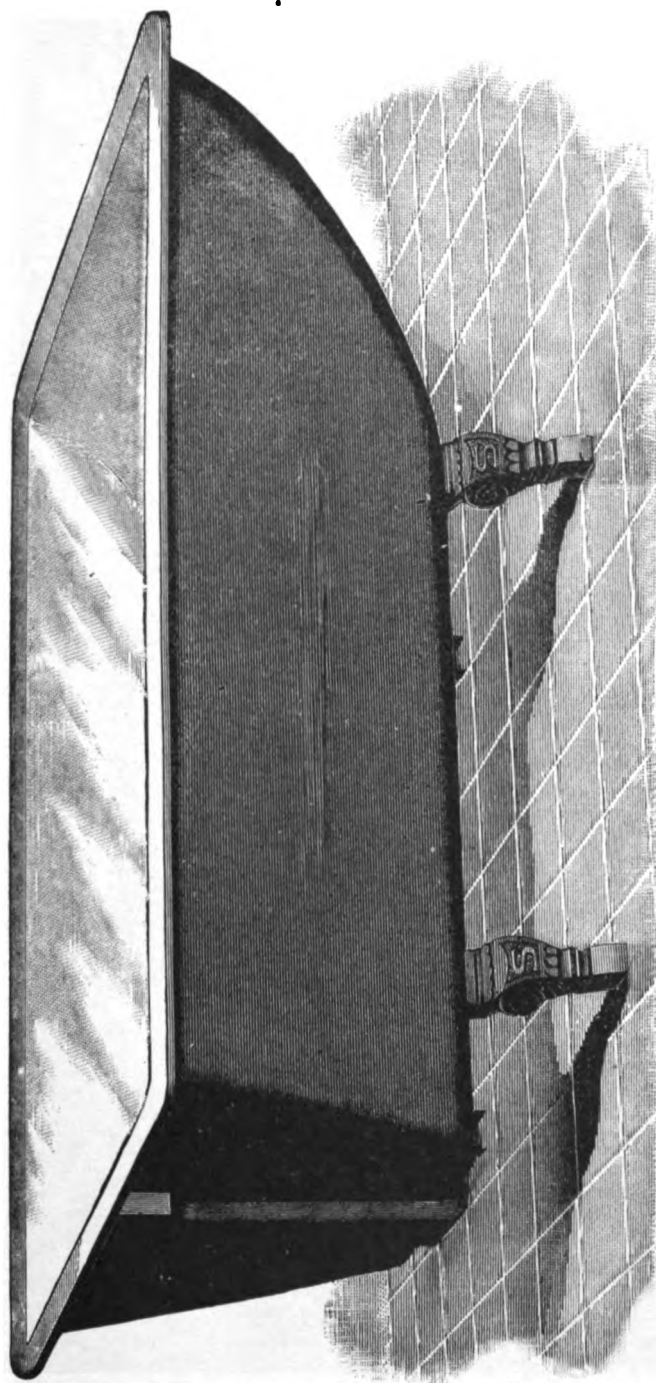


Plate 567.

With Patent Overflow, Nickel-plated Overflow Strainer, Waste Plug and Rubber Stopper.

DIMENSIONS: Width inside, 22 inches; depth, 18 inches; from Floor to top of Flange, 25½ inches.

	4½ ft.	5 ft.	5½ ft.
Porcelain, Enameled	\$30 50	36 50	38 50
Painted	15 00	18 00	19 50

RUMSEY'S STANDARD PORCELAIN ENAMELED BATH.

FRENCH PATTERN.

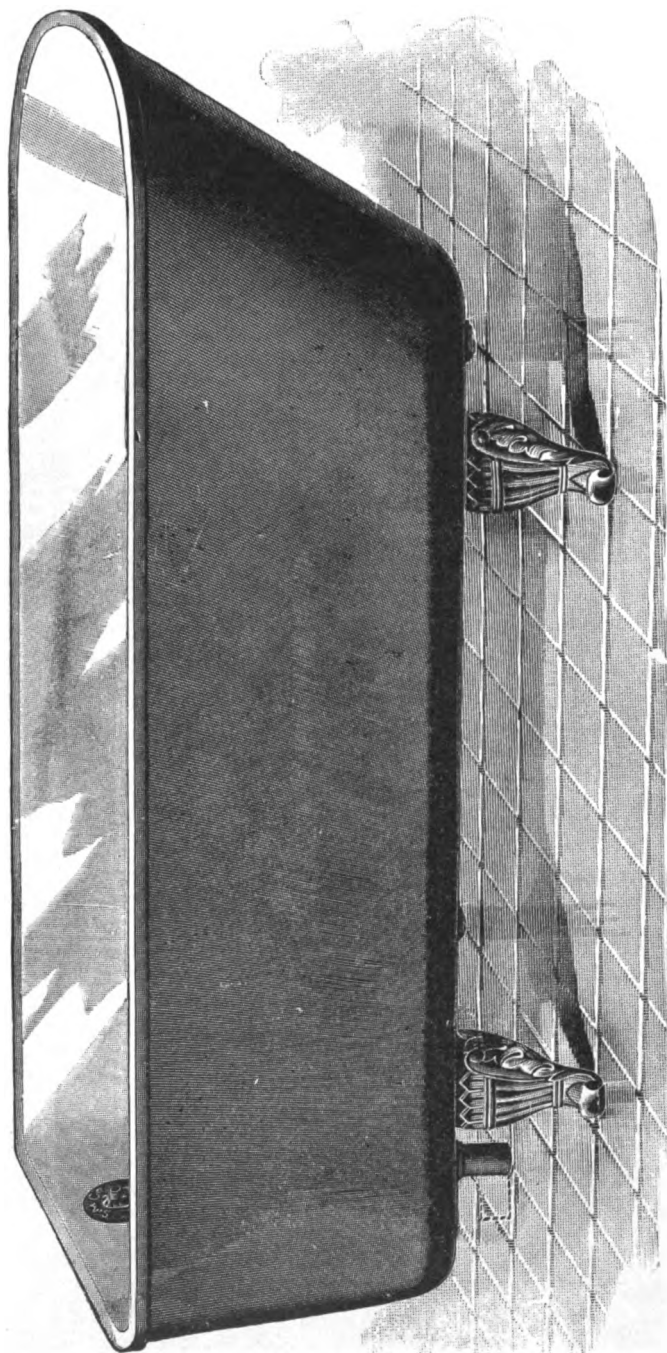


Plate 568.

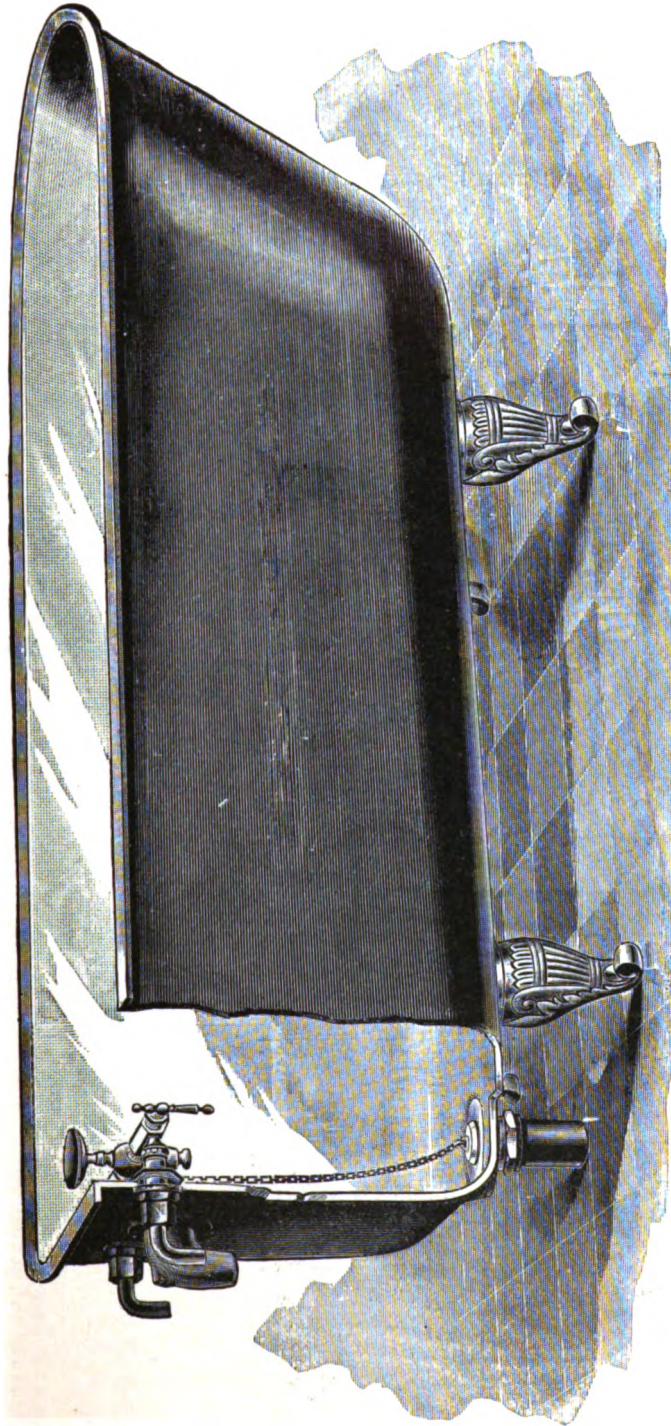
With Nickel-plated Overflow Strainer, Waste Plug and Rubber Stopper.

DIMENSIONS: Width inside, 23 inches, depth, 18 inches; from Floor to top of Flange, 26 inches.

	3½	3	4½	5	5½	6 ft.
Porcelain Enameled	\$22 50	25 50	28 50	31 50	34 50	37 50
Painted	12 00	13 50	15 00	16 50	18 00	19 50

RUMSEY'S STANDARD PORCELAIN ENAMELED BATH.

FRENCH PATTERN.

**Plate 569.**

With No. 4½ Nickel-plated Fuller Combination Bath Cock, Shampoo Sprinkler, Nickel-plated Overflow Strainer, Waste Plug and Rubber Stopper.

Dimensions: Width inside, 23 inches; depth, 18 inches; from Floor to top of Flange, 26 inches.

Porcelain Enameled	3½ ft.	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.
	\$26 00	29 00	32 00	35 00	38 00	41 00

RUMSEY'S STANDARD PORCELAIN ENAMELED ROLL RIM BATH.

THE ELYSIAN—WITH 3-INCH ENAMELED ROLL RIM.

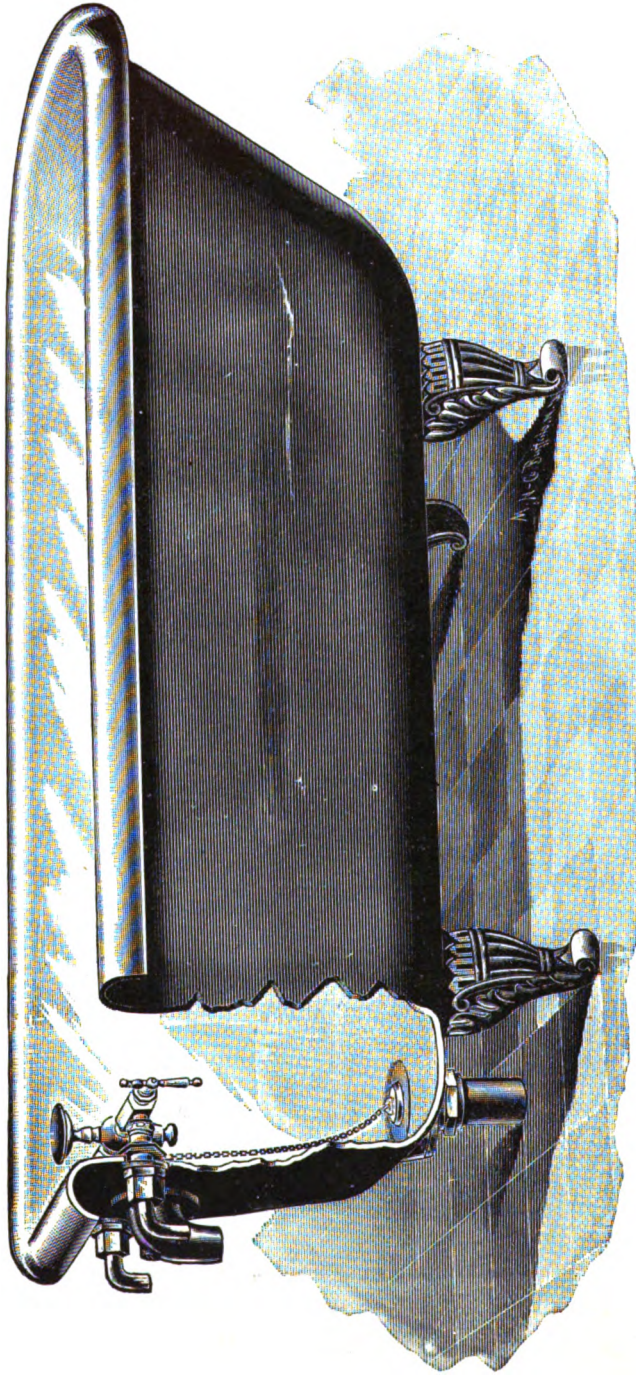


Plate 570.

With No. 4½ Nickel-plated Fuller Combination Bath Cock, Shampoo Sprinkler, Nickel-plated Overflow Strainer, Waste Plug and Rubber Stopper.

Size	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.
Price, Porcelain Enameled	\$37 50	41 00	45 50	51 00	61 00
Length from out to out of Rim	4 ft. 5 in.	4 ft. 10 in.	5 ft. 4 in.	5 ft. 10 in.	6 ft. 6 in.
Width from out to out of Rim	29 in.	29 in.	29 in.	29 in.	29 in.
Depth	18½ in.	18½ in.	18 ¼ in.	18½ in.	18½ in.
From Floor to top of Rim	25½ in.	25½ in.	25½ in.	25½ in.	25½ in.

If outside of Tub is painted White or Ivory Tint, add \$10.00.

HEATER AND TANK.

As Set and Connected when there is no City Pressure.

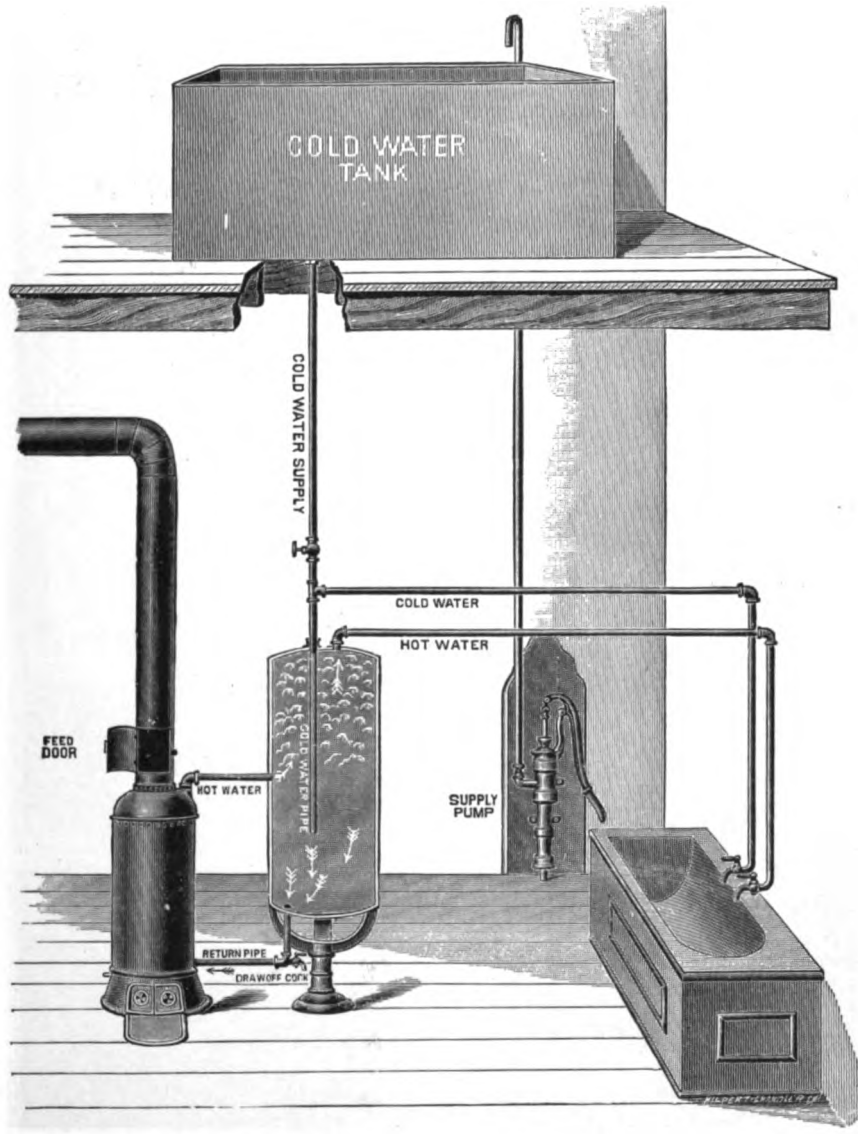


Plate 571.

SHOWING AN ARRANGEMENT FOR WATER SUPPLY IN HOUSES WHERE THERE ARE NO WATER WORKS.

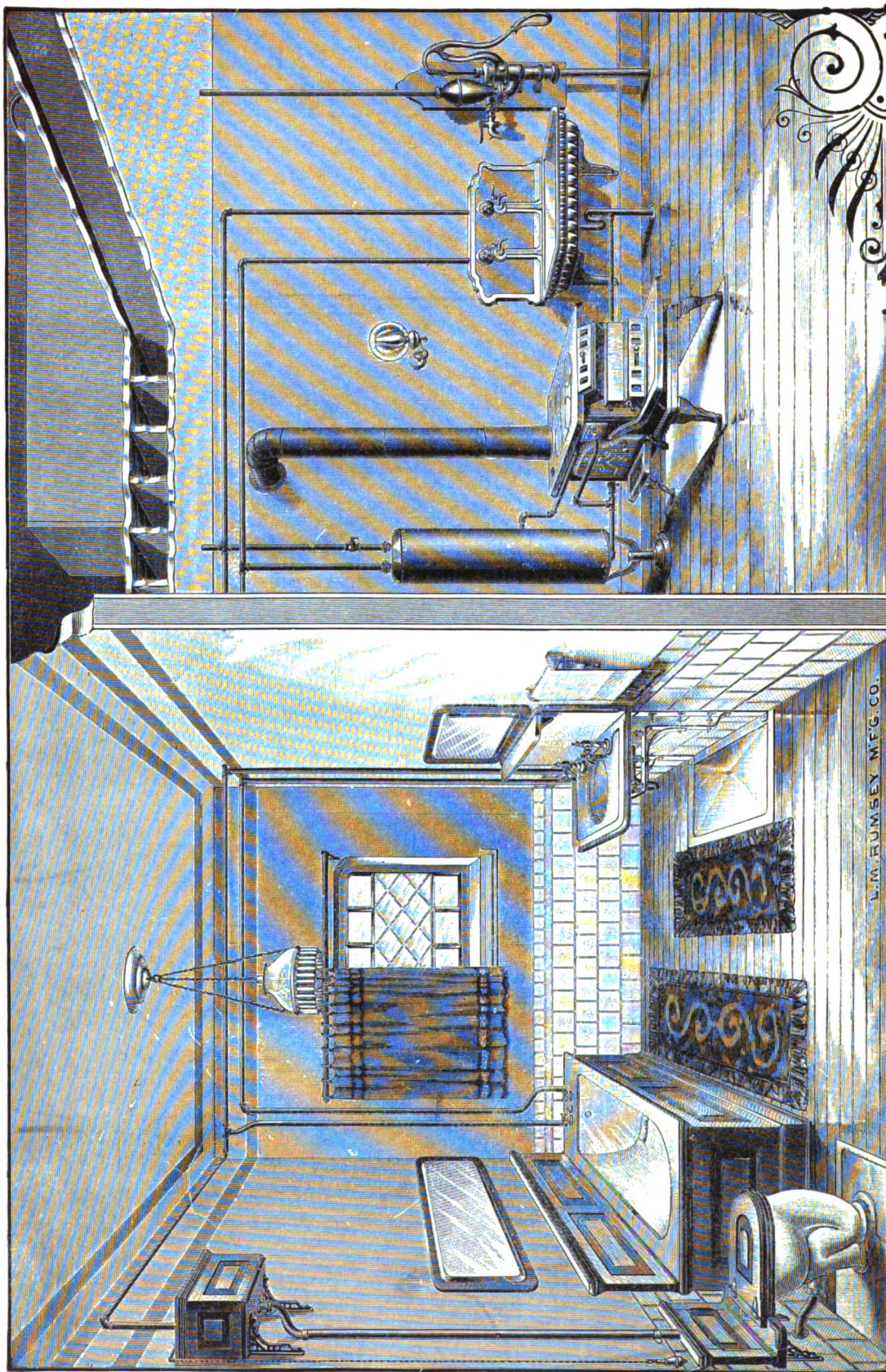
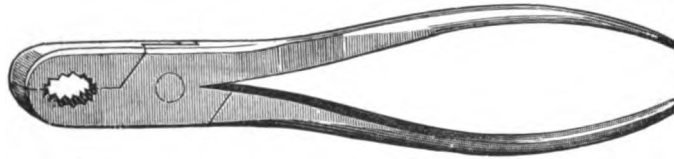


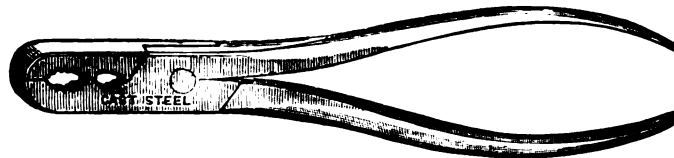
Plate 572.

GAS PLIERS.**Plate 573.**

Polished, 5 inch, per doz. \$8 00

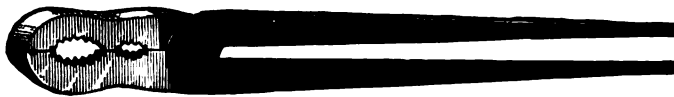
Polished, 6 inch, per doz. 9 00

Add for Nickel-plating, \$1.00 per dozen, net.

**Plate 574.**

Polished, 7 inch per doz \$10 00

Add for Nickel-plating, \$1.00 per dozen, net.

**Plate 575.**

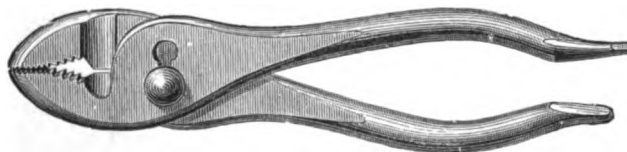
Size	8	9	10	11	12	13	14 in.
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Black Handle, Polished Head, per doz . .	\$12 00	14 00	15 00	16 00	18 00	21 00	24 00
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Add to list for Full Polished, \$3.00 per dozen.

PEASE'S COMBINATION PLIER.

GAS PLIER, WIRE CUTTER, WRENCH AND SCREW-DRIVER, COMBINED.

**Plate 576.**

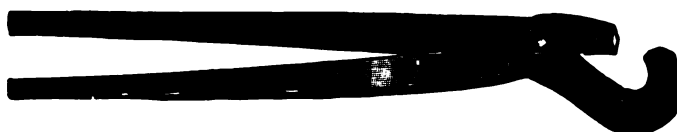
Size	6	10 in.
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Nickel-plated, per doz.	\$15 00	21 00
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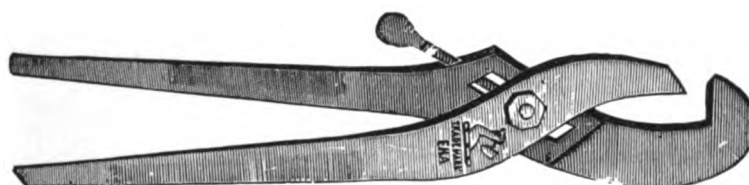
Black, per doz.	13 50	18 00
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PIPE TONGS.

MADE EXTRA HEAVY AND STRONG.

**Plate 577.**

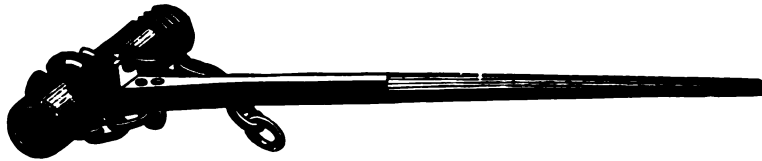
Size .	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6 in.
Each .	\$0 60	65	70	75	90	1 10	1 30	1 50	1 90	2 50	4 25	5 25	6 25	9 00	11 00

BROWN'S ADJUSTABLE PIPE TONGS.**Plate 578.**

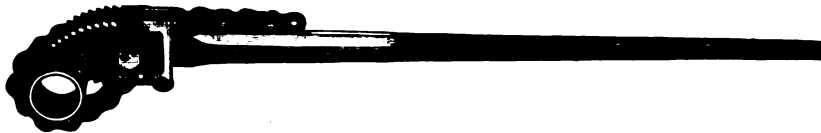
Number	1	$1\frac{1}{2}$	2	3	4	5	6	7
Size, for Pipe . . .	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	$\frac{1}{2}$ to $1\frac{1}{4}$	1 to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	3 to 5	4 to 7 in.
Each	\$1 30	1 65	2 00	3 00	6 00	11 00	25 00	35 00

JARECKI'S ADJUSTABLE PIPE TONGS.**Plate 579.**

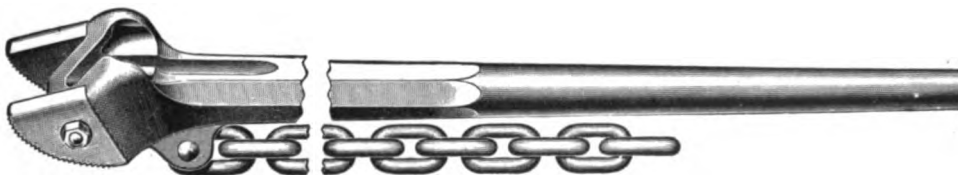
Number	0	1	2	3	4	5
Length	12	15	24	30	34	55 in.
Grips, from	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{2}$ to $2\frac{1}{2}$	$\frac{3}{4}$ to $3\frac{1}{2}$	$2\frac{1}{2}$ to 6
Each	\$3 00	3 50	4 00	5 00	9 00	16 00
Extra Tong Bits	30	30	50	75	1 00	2 50
Extra Worm Wheels	30	30	50	60	75	1 50
Extra Handles—						
Jaw or Hook part, each,	1 00	1 00	1 25	1 50	1 75	3 00

ROBBIN'S CHAIN TONGS.**Plate 580.**

Number	2	3	4	5	6	7
Length of Lever	2 $\frac{3}{4}$	3	4	5	6	7 ft.
Diameter of Chain (Link)	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$ in.
Average Weight	7	12	24	33	50	115 lbs.
Takes Pipe from	1 to 2	1 $\frac{1}{4}$ to 4	2 to 6	2 $\frac{1}{2}$ to 8	4 to 10	6 to 12 in.
Price, each	\$5 50	6 25	9 00	12 50	16 00	30 00

CHAMPION CHAIN PIPE WRENCH.**Plate 581.**

Number	0	1	2	3	4
Price, each	\$2 50	3 50	5 50	7 50	11 00
Capacity	$\frac{1}{8}$ to 1	$\frac{1}{4}$ to 2	$\frac{1}{4}$ to 3	$\frac{1}{4}$ to 6	1 $\frac{1}{2}$ to 10 in.
Length	12 $\frac{1}{2}$	19 $\frac{1}{2}$	28	38 $\frac{1}{4}$	50 $\frac{1}{2}$ in.
Weight	1 $\frac{1}{4}$	4 $\frac{1}{4}$	8	15	28 lbs.
Extra Chain, each	\$0 75	1 00	1 50	2 50	4 00
Extra Jaws, each	1 00	1 75	2 75	4 00	5 50

TRIMO CHAIN PIPE WRENCH.**Plate 582.**

Number	1	2	3	4	5
Price, each	\$3 50	5 50	7 50	11 00	18 00
Length	20	27	37	50	64 in.
Size of Pipe	1 to 2 $\frac{1}{2}$	1 to 3 $\frac{1}{2}$	1 $\frac{1}{4}$ to 6	1 $\frac{1}{2}$ to 8	2 to 14 in.
Extra Chains, each	\$1 00	1 50	2 50	4 00	6 00
Extra Jaws, each	80	1 25	2 00	2 50	3 00

In ordering parts, state the size of Wrench.

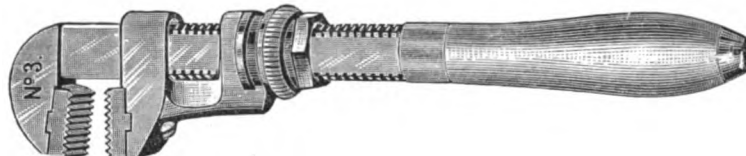
STILLSON WRENCHES.**Plate 583.****6 TO 18 INCHES.**

Length when open . . .	6	8	10	14	18 in.
Grips	$\frac{1}{8}$ in. wire to $\frac{1}{2}$ in. pipe.	$\frac{1}{8}$ in. wire to $\frac{3}{4}$ in. pipe.	$\frac{1}{8}$ in. wire to 1 in. pipe.	$\frac{1}{4}$ in. wire to 1 $\frac{1}{2}$ in. pipe.	$\frac{1}{4}$ in. wire to 2 in. pipe.
Each	\$2 00	2 00	2 25	3 00	4 00

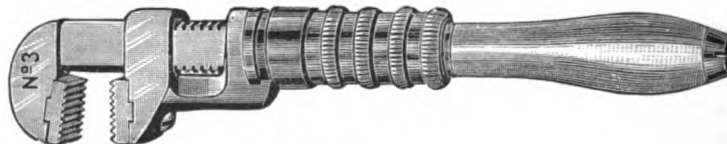
6 inch wrench with screw driver attachment on end of handle. Finished, each, \$2.37;
Nickel-plated, \$2.75.

24 TO 48 INCHES.**Plate 584.**

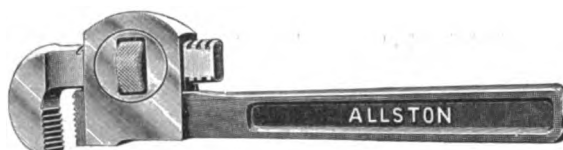
Length when open	24	36	48 in.
Grips	$\frac{1}{4}$ in. wire to 2 $\frac{1}{2}$ in. pipe.	$\frac{1}{4}$ in. pipe to 3 $\frac{1}{2}$ in. pipe.	1 in. pipe to 5 in. pipe.
Each	\$6 00	12 00	18 00

B & C No. 3 PIPE WRENCHES.**Plate 585.****BRIGHT.****WITH SHORT NUT.**

10 inch, adjustable to pipe from $\frac{1}{2}$ inch to 1 inch in diameter, per doz	\$27 00
12 inch, adjustable to pipe from $\frac{1}{2}$ inch to 1 $\frac{1}{2}$ inches in diameter, per doz	33 00
15 inch, adjustable to pipe from $\frac{1}{2}$ inch to 2 inches in diameter, per doz	37 50
18 inch, adjustable to pipe from $\frac{1}{2}$ inch to 2 $\frac{1}{2}$ inches in diameter, per doz	48 00
21 inch, Iron Handle, adjustable to pipe from $\frac{1}{2}$ inch to 3 inches in diameter, per doz	66 00

**Plate 586.****BRIGHT.****WITH LONG NUT.**

10 inch, adjustable to pipe from $\frac{1}{2}$ inch to 1 inch in diameter, per doz	\$28 50
12 inch, adjustable to pipe from $\frac{1}{2}$ inch to 1 $\frac{1}{2}$ inches in diameter, per doz	35 00
15 inch, adjustable to pipe from $\frac{1}{2}$ inch to 2 inches in diameter, per doz	40 00
18 inch, adjustable to pipe from $\frac{1}{2}$ inch to 2 $\frac{1}{2}$ inches in diameter, per doz	52 50

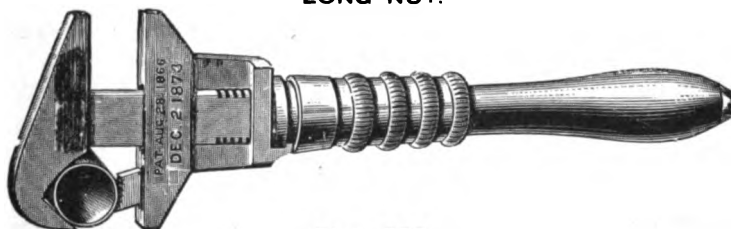
ALLSTON WRENCH.**Plate 587.**

Length when open.	6	8	10	14	18	24	36 in.
Grips	$\frac{1}{8}$ in. wire to $\frac{1}{8}$ in. pipe.	$\frac{1}{8}$ in. wire to $\frac{3}{8}$ in. pipe.	$\frac{1}{8}$ in. wire to 1 in. pipe.	$\frac{1}{4}$ in. wire to $1\frac{1}{2}$ in. pipe.	$\frac{1}{4}$ in. wire to 2 in. pipe.	$\frac{3}{8}$ in. wire to $2\frac{1}{2}$ in. pipe.	$\frac{1}{2}$ in. pipe to $3\frac{1}{2}$ in. pipe.
Each	\$2 00	2 00	2 25	3 00	4 00	6 00	12 00
Extra Jaws, each .	67	67	75	1 00	1 33	2 00	4 00
Extra Nuts, each .	20	20	27	35	42	50	65

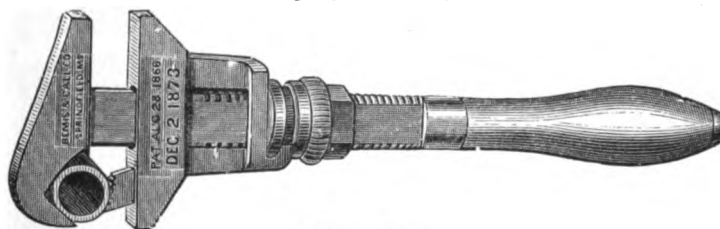
TRIMO PIPE WRENCH.**Plate 588.**

Length open, in inches	6	8	10	14	18	24	36	48
Takes from	$\frac{1}{8}$ in. wire to $\frac{1}{8}$ in. pipe.	$\frac{1}{8}$ in. wire to $\frac{3}{8}$ in. pipe.	$\frac{1}{8}$ in. wire to 1 in. pipe.	$\frac{1}{4}$ in. wire to $1\frac{1}{2}$ in. pipe.	$\frac{1}{4}$ in. wire to 2 in. pipe.	$\frac{1}{4}$ in. wire to $2\frac{1}{2}$ in. pipe.	$\frac{3}{8}$ in. pipe to $3\frac{1}{2}$ in. pipe.	1 in. pipe to 5 in.
Each	\$2 00	2 00	2 25	3 00	4 00	6 00	12 00	18 00
Jaw	67	67	75	1 00	1 33	2 00	4 00	6 00
Nut	20	20	27	35	42	50	65	80
Inserted Jaw . . .	25	25	33	50	55	65	1 00	1 25
Frame	25	25	33	45	55	65	75	1 00

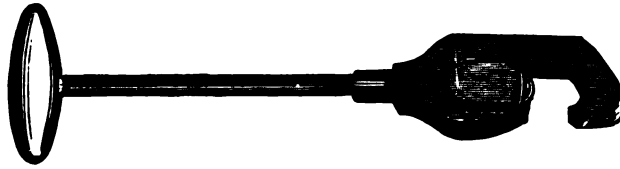
In ordering parts, state the size of Wrench.

BEMIS & CALL'S COMBINATION WRENCHES.**LONG NUT.****Plate 589.**

Bright, 10 inch, adjustable to Pipe from $\frac{1}{2}$ to 1 inch, per doz	\$25 25	Extra Grips.
Bright, 12 inch, adjustable to Pipe from $\frac{1}{2}$ to $1\frac{1}{2}$ inches, per doz	28 50	0 25 each.
Bright, 15 inch, adjustable to Pipe from $\frac{1}{2}$ to 2 inches, per doz	40 50	30 each.
		35 each.

SHORT NUT.**Plate 590.**

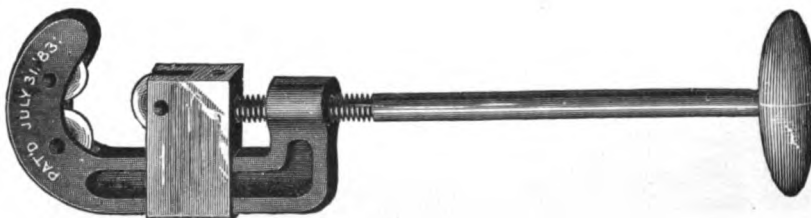
10 inch, adjustable to Pipe from $\frac{1}{2}$ inch to 1 inch, per doz	\$23 00	Extra Grips.
12 inch, adjustable to Pipe from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches, per doz	26 00	0 25 each.
15 inch, adjustable to Pipe from $\frac{1}{2}$ inch to 2 inches, per doz	37 00	30 each.
		35 each.

STANWOOD'S PIPE CUTTER.**Plate 591.**

Number	1	2	3
Cuts Pipe from	$\frac{1}{8}$ to 1	1 to 2	2 to 3 in.
Case Hardened, each	\$1 50	2 25	7 00
Steel Faced, each	1 75	2 50	7 50
Cutter Wheels, each	12	18	25
Cutter Blocks and Wheels, each	40	60	1 00

WALWORTH'S PIPE CUTTER.**Plate 592.**

Number	1	2	3
Cuts Pipe from	$\frac{1}{8}$ to 1	1 to 2	2 to 3 in.
Complete, each	\$1 50	2 25	7 00
Cutter Wheels, each	12	18	25
Cutter Blocks and Wheels, each	40	60	1 00

BARNES' THREE-WHEEL PIPE CUTTER.**Plate 593.**

Number	1	2	3	4	5	6	7
Cuts Pipe from	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	4 to 6	6 to 8	9 to 12 in.
Complete, each	\$4 50	6 00	10 00	20 00	30 00	40 00	50 00
Extra Cutter Wheels, each	25	30	40	50	75	75	75
Extra Wheel Pins, each	10	10	12	15	20	25	25

SAUNDERS' WHEEL AND ROLLER PIPE-CUTTER.**Plate 594.**

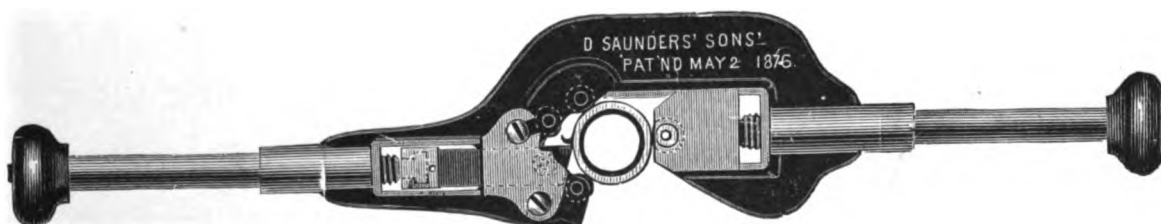
	Extra Wheels	Extra Blocks and Wheels	Extra Pins
No. 1, cuts Pipe $\frac{1}{8}$ to 1 inch, inclusive, each . . .	24	1 25	10
No. 2, cuts Pipe 1 to 2 inches, inclusive, each . . .	32	1 75	10
No. 3, cuts Pipe 2 to 3 inches, inclusive, each . . .	60	3 25	15

SAUNDERS' THREE-WHEEL PIPE-CUTTER.**Plate 595.**

	Extra Wheels	Extra Blocks and Wheels	Extra Pins
No. 1, cuts Pipe $\frac{1}{8}$ to 1 inch inclusive, each. . . .	24	1 25	10
No. 2, cuts Pipe 1 to 2 inches, inclusive, each . . .	32	1 75	10
No. 3, cuts Pipe 2 to 3 inches, inclusive, each . . .	60	3 25	15

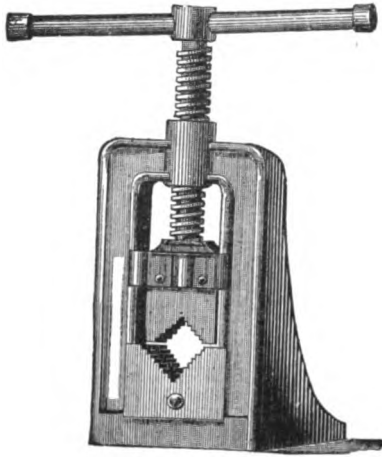
SAUNDERS' TOOL CUTTER.

FOR PIPE AND TUBE.

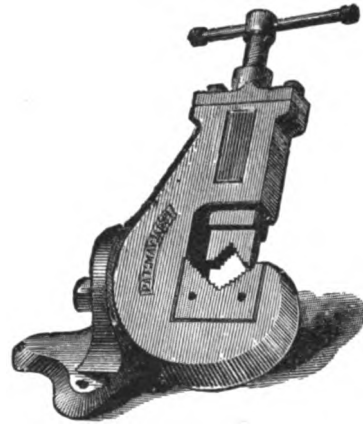
**Plate 596.**

No. 1, $\frac{1}{8}$ to 1 inch, inclusive, each	\$ 6 50
No. 2, 1 to 2 inches, inclusive, each	8 00
No. 3, 2 to 3 inches, inclusive, each	16 00

No. 1 Tool, 18 cents; No. 2, 25 cents; No. 3, 35 cents.

MALLEABLE IRON PIPE VISE.**Plate 597.**

No. 1, holds Pipe $\frac{1}{8}$ to 2 in. diam., each . . \$ 8 00
 No. 2, holds Pipe $\frac{1}{4}$ to 3 in. diam., each . . 12 00

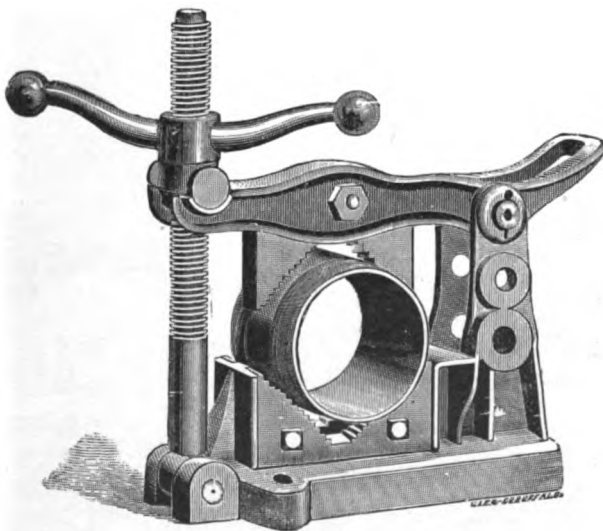
NASON'S PIPE VISE.**Plate 598.**

No. 1, to hold from $\frac{1}{8}$ to $1\frac{1}{4}$ in. pipe, each . \$15 00
 No. 2, to hold from $\frac{1}{8}$ to 2 in. pipe, each . . 18 00
 No. 3, to hold from $\frac{1}{4}$ to 3 in. pipe, each . . 30 00

PHOENIX PIPE VISES.

Frame of best malleable iron, hinged as shown in the cut. Screw and lever of Bessemer steel. Milled and tempered steel jaws.

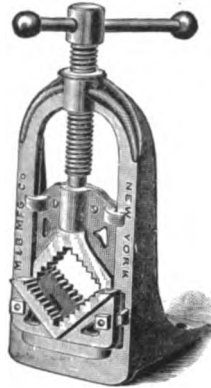
No. 5, for $\frac{1}{8}$ to $2\frac{1}{2}$ inch Pipe, each \$5 00
 No. 10, for $\frac{1}{4}$ to 4 inch Pipe, each 9 00

**Plate 599.****Plate 600.****THE JARECKI PIPE VISE.**

Number . .	1A	2A	3A	4A
Takes Pipe .	$\frac{1}{8}$ to 2	$\frac{1}{8}$ to 4	$1\frac{1}{2}$ to 6	6 to 12 in
Each . . .	\$12 00	16 00	24 00	60 00

PHŒNIX PIPE VISE.

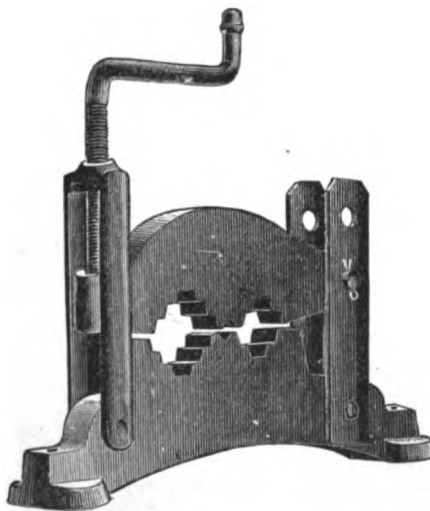
ALL CAST STEEL.

**Plate 601.**

The frame of this Vise is made of the best quality of refined steel, and combines lightness with great strength and durability.

Takes from $\frac{1}{8}$ to 2 inch Pipe. Weight, 8 pounds.

Each \$4 50

CLARK'S PIPE VISE.**Plate 602.**

Takes from $\frac{1}{8}$ to 2 inch Pipe.

Each \$3 00

THE WALWORTH BENCH AND PIPE VISE.

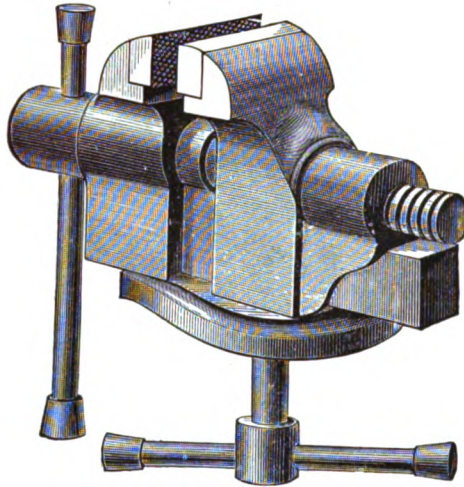


Plate 603.

5 inch Jaw, each \$18 00

This style Vise has been used by steam-fitters for years, and as they are made from the very best material, they cannot fail to give satisfaction. The parts are all made interchangeable, the Jaws are of the best steel, and the Teeth are milled so that they will hold pipe until entirely worn out.

PARKER'S COMBINATION PIPE VISE.

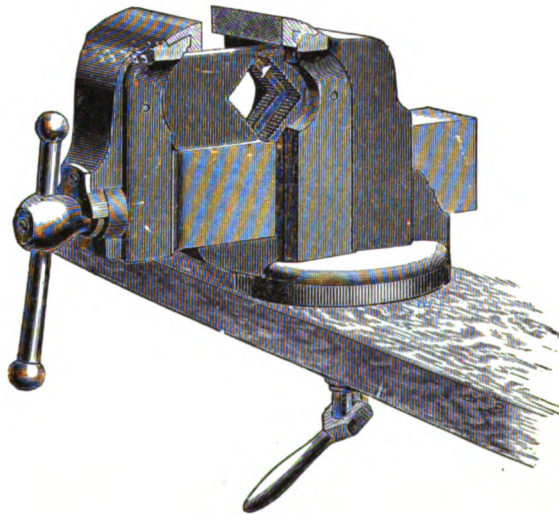


Plate 604.

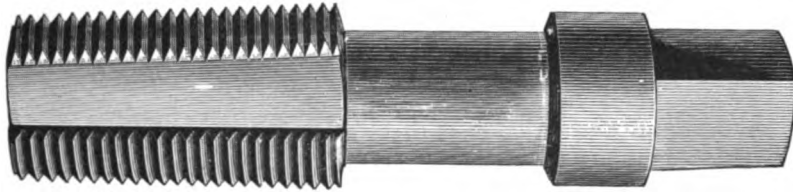
No. 87, Round and Pipers' Jaws, weight 41 pounds, for holding 2 inch pipe and under, each . . . \$16 00
 No. 88, Round and Pipers' Jaws, weight 59 pounds, for holding 3 inch pipe and under, each . . . 20 00
 No. 88½, Round and Pipers' Jaws, weight 94 pounds, for holding 4 inch pipe and under, each . . . 28 00
 No. 89½, Round and Pipers' Jaws, weight 141 pounds, for holding 6 inch pipe and under, each . . . 35 00

EXTRA PIPE JAWS FOR PARKER'S VISE.

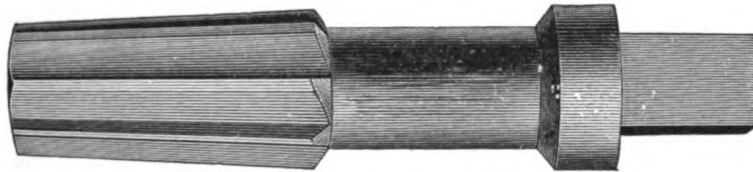
Number	87	88	88½	89½
Per set	\$3 50	4 00	5 00	6 00

PIPE TAP.

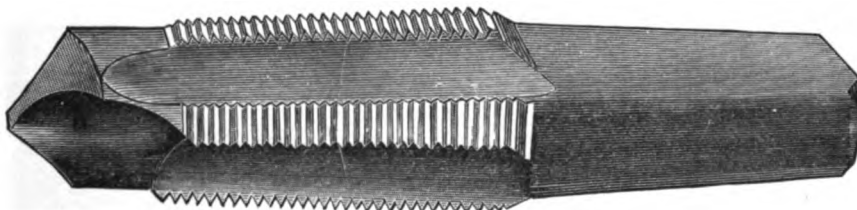
RIGHT OR LEFT.

**Plate 605.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$1 12	1 25	1 50	1 87	2 50	3 12	3 75	4 62	6 25	10 50	15 00

PIPE REAMER.**Plate 606.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Each	\$1 12	1 25	1 50	1 87	2 50	3 12	3 75	4 62	6 25	10 50	15 00

MORSE COMBINED PIPE TAP AND DRILL.**Plate 607.**

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Each	\$1 50	1 75	2 20	3 00	3 30	5 00	5 85	7 60	12 00

FLAT PIPE DRILL.**Plate 608.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in.
Each	\$1 00	1 10	1 15	1 20	1 30	1 50	1 75	2 00	2 50

CLARK'S RATCHET STOCK.**Plate 609.**

No. 1, Ratchet Stock, with Lead Screw, Dies and Bushings for $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$ and $1\frac{1}{2}$ inch Pipe . .	\$22 50
No. 1, Ratchet Stock, with Lead Screw and Bushings, without Dies, each	10 00
Extra Dies, for No. 1 Ratchet Stock, each	2 50
Extra Bushings, for No. 1 Ratchet Stock, each.	50
No. 2, Ratchet Stock, with Lead Screw, Bushings and Dies for 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch Pipe, each. .	29 00
No. 2, Ratchet Stock, with Lead Screw and Bushings, without Dies, each	15 00
Extra Dies, for No. 2 Ratchet Stock, each	3 50
Extra Bushings, for No. 2 Ratchet Stock, each	60

GLEASON'S SCREWING STOCK.

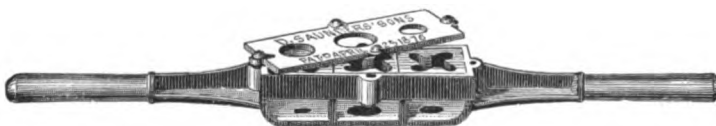
FOR BRASS PIPE.

**Plate 610.**

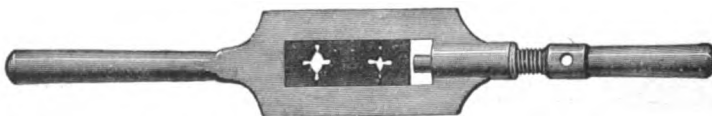
Cutting $\frac{1}{8}$ to $\frac{3}{8}$ inch Brass Pipe, each	\$10 00
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SAUNDERS' COMBINATION SCREWING STOCK.

WITH LOOSE DIES.

**Plate 611**

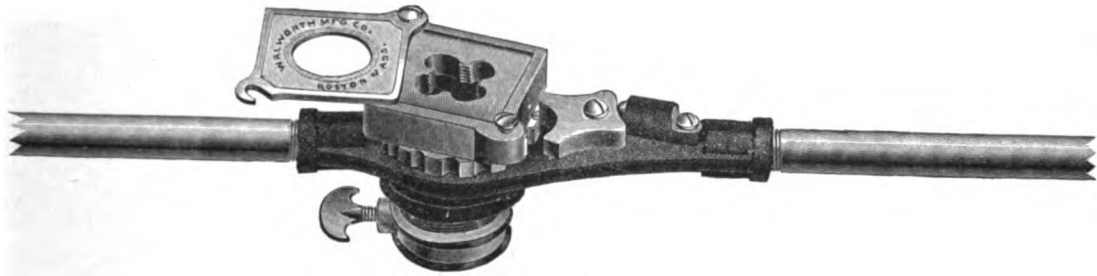
No. 0, Cuts $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ inch Pipe, each . .	\$8 00	No. 00, Cuts $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch Pipe, each . .	\$9 00
No. 0, Extra Dies, right or left, each	1 00	No. 00, Extra Dies, right or left, each	1 50

PUMP STOCK AND DIES.**Plate 612.**

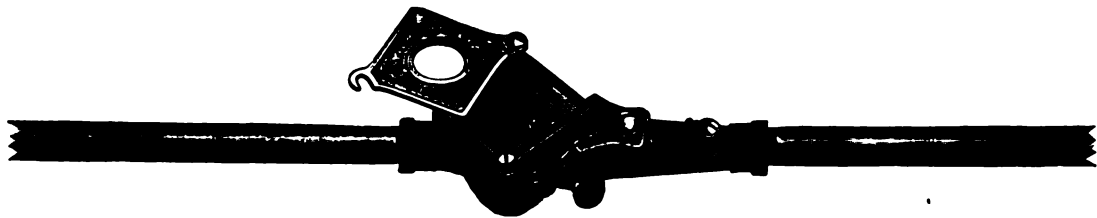
No. 1, Cuts $\frac{3}{8}^{14}$, and $\frac{7}{8}^{12}$, each	\$3 00	No. 2, Cuts $\frac{3}{8}^{14}$, $\frac{7}{8}^{12}$ and $\frac{1}{2}^{12}$, each. . . .	\$3 50
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MILLER'S REVERSIBLE RATCHET DIE PLATES,

Nos. C, D AND E.

**Plate 613.**

Nos. A AND B.

**Plate 614.****MILLER'S REVERSIBLE RATCHET DIE PLATES—PLATES 613 AND 614.**

WITH HILL'S PATENT SOLID DIES.

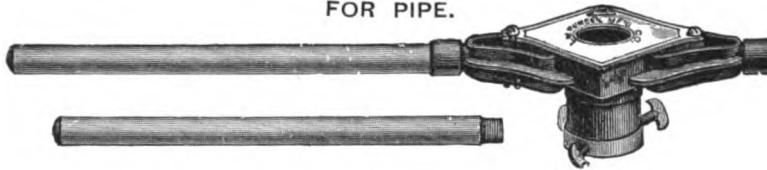
Numbers	Threads	Dimensions of Dies	Die Plates Complete	Without Dies	Extra Dies	Extra Bushings	Extra Die Frames
No. A . . .	$\frac{1}{8}$ to $\frac{3}{4}$	2 x 2 x $\frac{1}{2}$	\$13 00	7 50	1 10	20	. .
No. B . . .	$\frac{1}{4}$ to 1	$2\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{4}$	15 00	7 50	1 50	25	22
No. C . . .	1 to $1\frac{1}{2}$	3 x 3 x $\frac{3}{4}$	18 50	13 00	1 80	35	30
No. D . . .	$1\frac{1}{4}$ to 2	4 x 4 x $\frac{7}{8}$	20 00	12 50	2 50	45	38
No. E . . .	$2\frac{1}{2}$ and 3	5 x 5 x $1\frac{1}{4}$	43 00	29 00	7 00	75	45

C, D, and E have Leader Screws.

Number of Plate	A	B	C	D	E
Space required around pipe, in order to properly thread it . . .	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5 in.

WALWORTH'S STOCKS AND DIES.

FOR PIPE.

**Plate 615.**

Number	0	1	1½	1¾	2	3
Dies furnished with each Plate	1/8 to 1/2	1/4 to 1	3/4, 1 & 1¼	1, 1¼ & 1½	1½, 1¾ & 2	2, 2½ & 3
Dimensions of Hill's Square Dies	2 x 1½	2½ x 3¼	3 x 3¼	3 x 3¼	4 x 7/8	5 x 1¼ in.
Die Plates with R. H. Dies, comp.	\$9 50	15 00	13 50	13 50	20 00	43 00
Die Plates without Dies	3 50	5 00	6 00	6 00	9 50	25 00

No. 3 Plate, with 4 handles, without Dies, \$33 00; with Dies, \$51 00
 Nos. 1½, 1¾, 2 and 3 Stocks have Leader Screws.

SOLID PIPE DIES.**DIE FRAME.****Plate 616.****Plate 617.****GUIDE.****Plate 618.****SOLID PIPE DIES.**

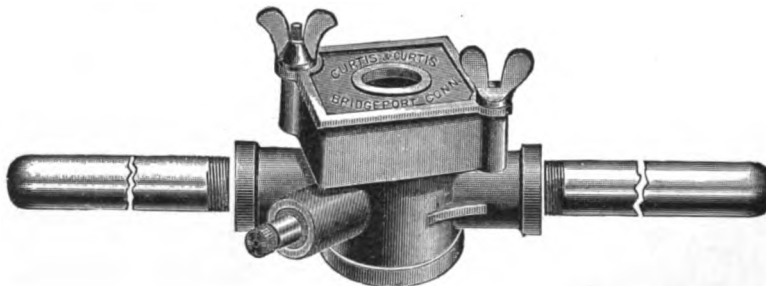
Dimensions	2 x 2 x 1/2	2½ x 2½ x 3/4	3 x 3 x 3/4	4 x 4 x 7/8	5 x 5 x 1¼ in.
Cuts Pipe	1/8, 1/4, 3/8, 1/2	1/8, 1/4, 3/8, 1/2, 3/4, 1	1/8, 1/4, 3/8, 1/2, 3/4, 1, 1¼, 1½	1, 1¼, 1½, 2	2½, 3 in.
Each	\$1 50	2 00	2 50	3 50	9 00

DIE FRAME.

Outside measurement	2½ x 2½	3 x 3	4 x 4	5 x 5
For Solid Pipe Dies	2 x 2	2½ x 2½	3 x 3	4 x 4
Each	\$0 30	40	50	60

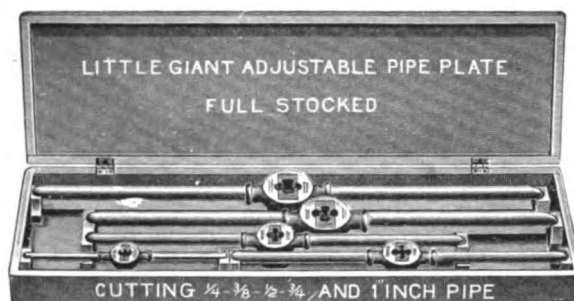
GUIDE.

For Walworth Stock, number	0	1	1½	1¾	2	3
Outside diameter	1½	1¾	1¾	1¾	2¾	3½
Each	\$0 25	35	45	45	60	1 00

CURTIS RATCHET DIE STOCK.**Plate 619.**

Number	Pipe sizes of Dies	Dimensions of Dies	Stock only, without Dies	Complete with R. H. Dies	Extra Dies, right or left	Extra Guides	Die Frames
1	1/4, 3/8, 1/2, 3/4, 1	2½ x 3¼	\$ 5 00	15 00	2 00	35	30
2	1, 1¼, 1½, 2	4 x 1	10 00	24 00	3 50	60	50

The No. 2 stock has Leader Screw.

LITTLE GIANT ADJUSTABLE PIPE PLATES.**FULL STOCKED.****Plate 620.**

No. P1, Stocks and Dies, for Cutting	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$	.....	\$ 8 00
No. P2, Stocks and Dies, for Cutting	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1	.....	11 50
No. P3, Stocks and Dies, for Cutting	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$	.....	16 00
No. P4, Stocks and Dies, for Cutting	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	.....	28 50

NEW LIGHTNING SCREW PLATE.**FOR PIPE.****Plate 621.**

These Dies are always ready for use, like solid Dies. No time is lost fitting them to size. They can be taken apart to be ground, and are adjustable for irregular sizes of fittings. They are made of the finest steel, and all parts are finished in the most perfect and handsome manner throughout. We intend these to be the best pipe plates in the world.

Set C, with five Dies, Right or Left, $\frac{1}{4}$ to 1 inch.

$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch, complete as above, in plain case	.....	\$12 00
$\frac{1}{8}$ inch supplied with this set, extra	.....	1 75

Parts separately: Stock, \$3.50; Dies, \$1.50 each; Guides, 25 cents each.

**Plate 622.**Set D, with three sizes, Right or Left, $1\frac{1}{4}$ to 2 inch, stock with Leader Screw.

$1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch, complete, as above, in plain case	.....	\$20 00
1 inch, if ordered with this set (including Bushing and Guide), extra	.....	3 00

Parts separately: Stock, \$7.00; Dies, \$4.00 each; Guides, 50 cents each.

Set C and D, combined with eight sizes, Right or Left, $\frac{1}{4}$ to 2 inch (large stock having Leader Screw), complete, in plain case	32 00
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ARMSTRONG'S ADJUSTABLE STOCKS AND DIES.

FOR PIPE AND BOLTS.

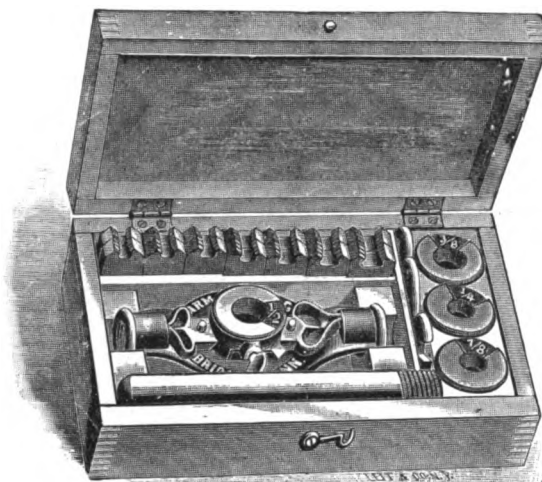


Plate 623.

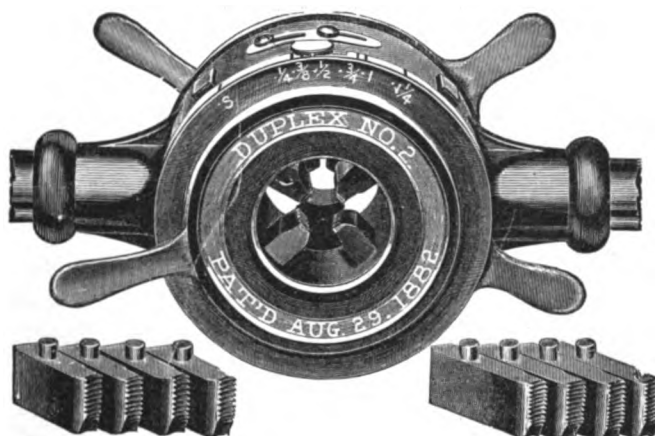
No. 1 Stock, 4 Pipe Dies, $\frac{1}{8}$ to $\frac{1}{2}$ inch, each	\$ 9 00
No. 1 Stock, 7 Bolt Dies, $\frac{1}{4}$ to $\frac{3}{4}$ inch, each	15 00
No. 1 Stock, 4 Pipe and 7 Bolt Dies, each	20 00
No. 2 Stock, 5 Pipe Dies, $\frac{1}{4}$ to 1 inch, each	12 00
No. 2 Stock, 7 Bolt Dies, $\frac{1}{2}$ to $1\frac{1}{4}$ inch, each	20 00
No. 2 Stock, 5 Pipe and 7 Bolt Dies, each	30 00
No. $2\frac{1}{2}$ Stock, 4 Pipe Dies, $\frac{1}{2}$ to $1\frac{1}{4}$ inch, each	12 00
No. 3 Stock, 4 Dies, 1 to 2 inch Pipe, each	24 00
No. 6 Stock, with Dies cutting $2\frac{1}{2}$ and 3 inch Pipe, each	40 00
No. 7 Stock, with Dies cutting $2\frac{1}{2}$ and 3 inch and $3\frac{1}{2}$ and 4 inch Pipe, each	60 00

PRICE LIST IN PARTS.

No. 1 Stock, each	\$ 3 00
No. 1 Pipe Dies, Right or Left, each	1 20
No. 1 Bolt Dies, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$ inch, each	1 50
No. 1 Bolt Dies, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$ inch, each	1 75
No. 1 Bolt and Pipe Bushings	20
No. 2 Stock, each	3 50
No. 2 Pipe Dies, Right or Left, each	1 50
No. 2 Bolt Dies, $\frac{1}{2}$ and $\frac{5}{8}$ inch, each	2 00
No. 2 Bolt Dies, $\frac{3}{4}$, $\frac{1}{2}$ and 1 inch, each	2 25
No. 2 Bolt Dies, $1\frac{1}{8}$ and $1\frac{1}{4}$ inch, each	2 50
No. 2 Bushings—Pipe or Bolt, each	25
No. 2 Long Guide, with Thumb Screw, each	50
No. $2\frac{1}{2}$ Stock, each	4 50
No. $2\frac{1}{2}$ Dies, Right or Left	3 00
No. $2\frac{1}{2}$ Bushings	40
No. 3 Stock, each	7 00
No. 3 Dies, Right or Left, each	4 00
No. 3 Bushings, each	50
No. 6 Stocks, without Dies, each	25 00
No. 6 Dies, cutting $2\frac{1}{2}$ and 3 inch, each	15 00
No. 6 Bushings, each	1 00
No. 7 Dies, per set of four pieces	16 00
No. 7 Bushings, each	1 50

DUPLEX DIE STOCK.

FOR PIPE.

**Plate 624.**

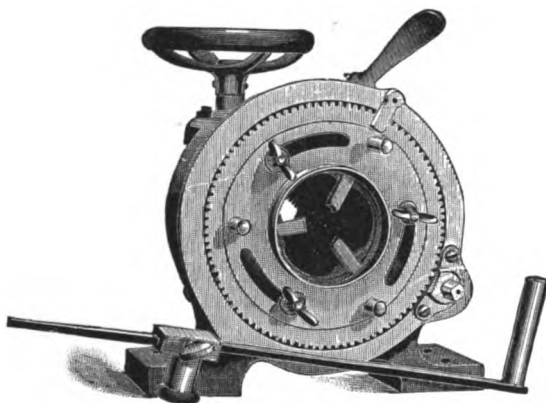
Size	No. 1	No. 2	No. 3
Cuts Iron Pipe Sizes.	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$	1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2
Price, without Cut-off	\$13 00	17 00	22 00
Price, with Cut-off	16 00	20 00	25 00
Extra Dies, per single set	1 50	1 75	2 00
Extra Lock-nuts	75	1 00	1 25
Extra Cam-plates	1 25	1 50	2 00

Size	No. 3½	No. 4	No. 5
Cuts Iron Pipe Sizes.	$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2	$1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3	$2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4
Price, without Cut-off	\$25 00	40 00	55 00
Price, with Cut-off	28 00	45 00	60 00
Extra Dies, per single set	2 00	3 50	4 00
Extra Lock-nuts	1 25	1 50	1 75
Extra Cam-plates	2 00	2 50	3 00

Nos. 1 AND 1 1-2 FORBES' PATENT DIE STOCK.

NO. 1 HAND MACHINE.

FRONT VIEW.



BACK VIEW.

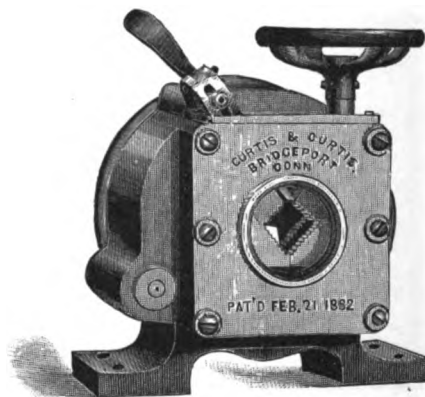


Plate 625.

No. 1 Hand Machine, Threads $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch pipe, both Right and Left, weight 80 lbs., with opening and adjustable dies, complete \$50 00

No. 1 A (Solid Die) Hand Machine is arranged for receiving $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch, Right or Left Solid Pipe Dies, weight 80 lbs., without Dies. 45 00

No. $1\frac{1}{2}$ Hand Machine, Threads 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$ and 3 inch Pipe, Right Hand, and 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch pipe Left Hand, weight 115 lbs., with opening and adjustable dies complete . . 75 00

FORBES' PATENT DIE STOCKS.

Nos. 2, 2 I-2, 2 I-2A, 2 I-2B, AND 2 I-2C.

NO. 2 MACHINE—FRONT VIEW.

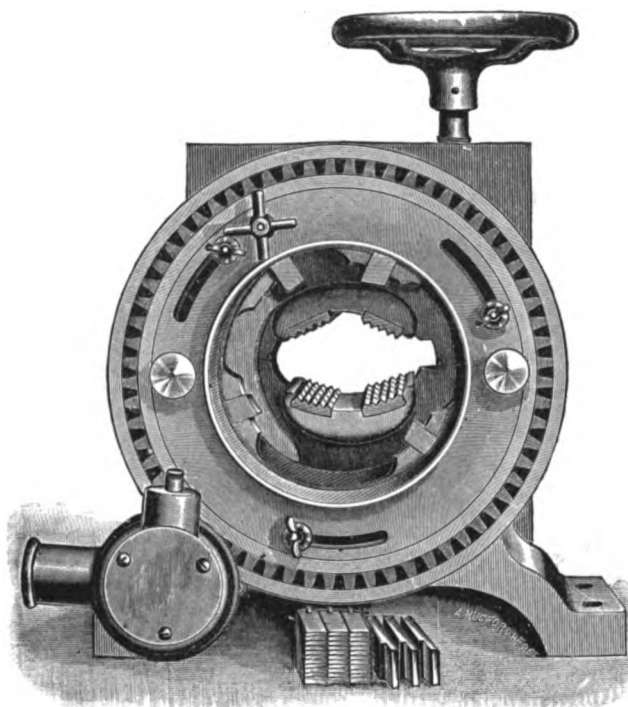
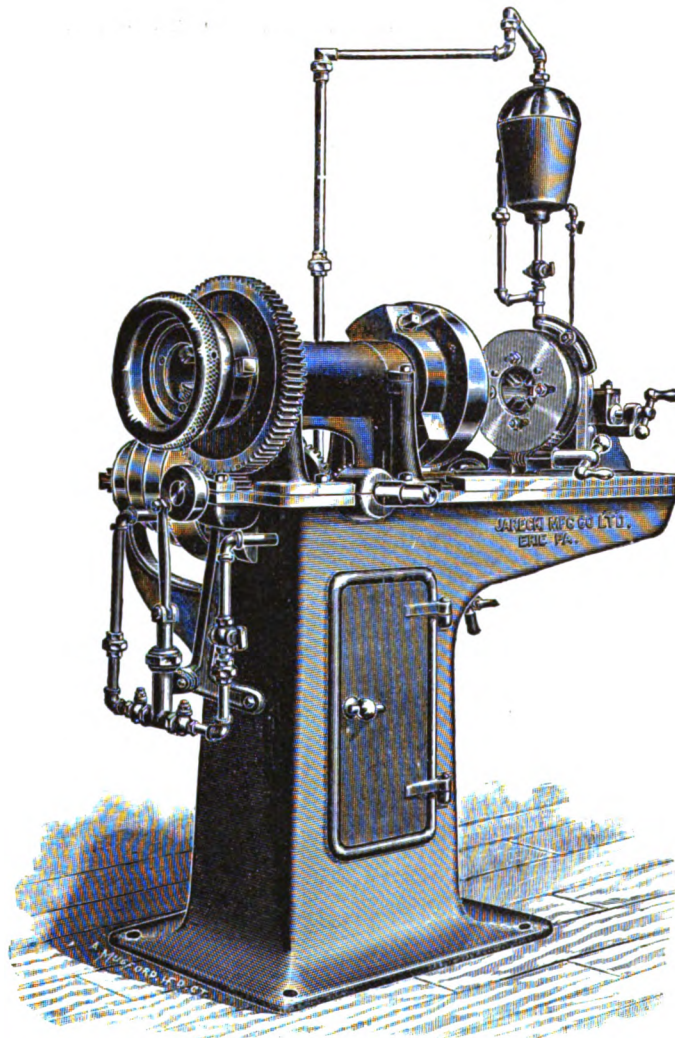


Plate 626.

These machines have opening and adjustable Dies, Self-Centering Vise, and an improved Cut-off Attachment.

- No. 2 Hand Machine; cuts off and threads $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 inch pipe, Right Hand; weight, 175 lbs. Price, with Opening and Adjustable Dies, complete \$85 00
- No. $2\frac{1}{2}$ Hand Machine; cuts off and threads $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 inch pipe, Right Hand; weight, 175 lbs. Price, with Opening and Adjustable Dies, complete 100 00
- No. $2\frac{1}{2}$ A Hand Machine; cuts off and threads $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 inch pipe, both Right and Left; weight, 180 lbs. Price, with Opening and Adjustable Dies, complete 115 00
- No. $2\frac{1}{2}$ B Hand Machine; cuts off and threads 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 inch pipe, Right Hand; weight, 180 lbs. Price, with Opening and Adjustable Dies, complete 110 00
- No. $2\frac{1}{2}$ C Hand Machine; cuts off and threads 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, and 4 inch pipe, both Right and Left Hand; weight, 185 lbs. Price, with Opening and Adjustable Dies, complete . 130 00

JARECKI PIPE MACHINE.**Plate 627.**

Can furnish extra dies for threading casing and line pipe. Also for English and Whitworth Standard Threads.

These Pipe Machines are without doubt the best and most convenient machines of their kind made. The dies are quick opening and adjustable. Each set of four pieces cuts two sizes of pipe, which is a great point in favor of the machine when new dies are required.

After pipe is threaded there is no backing off the dies as in the ordinary manner. All that is necessary is simply to open the dies and run die head back. If pipe is to be cut off the dies will expand far enough to admit of pipe passing through them to the cutting-off knife. When dies require sharpening they can be quickly removed and ground on any ordinary grind stone. The die head is also provided with an adjustable stop pin which is very convenient when a large number of threads of the same size are to be cut. Ordinarily every time a thread is cut the dies must be carefully reset. With this adjustable stop the dies are first set to the size to be threaded, then the adjustable stop moved and secured, which will only allow the cam to move to the point required to thread the proper size without the necessity of carefully resetting for every thread that is to be cut. The pump insures a steady supply of oil to lubricate dies and knife.

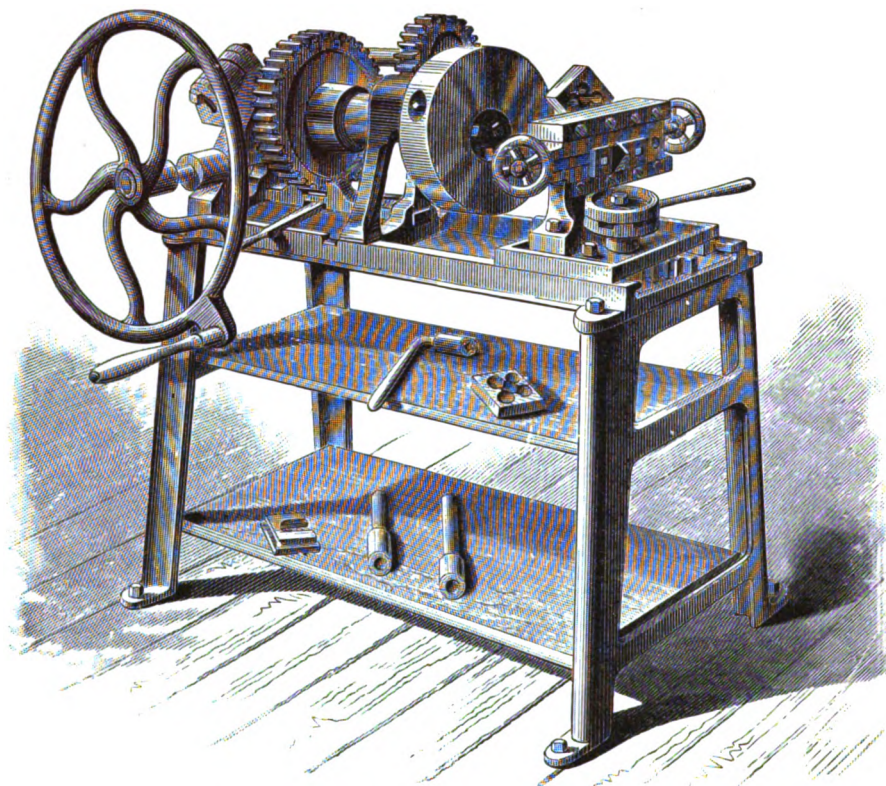
There are no loose bushings on the machine which, when required, cannot be found. Our machine has on back end of spindle an adjustable self-centering chuck to centre the pipe. Also the same on die head to steady the pipe when being cut with cutting-off knife. The gripping chuck is self-centering too and very powerful.

See next page for list prices. Send for special catalogue on pipe machines.

JARECKI PIPE MACHINES.

	Sizes Threads will cut, Inches	Diam- eter Pulleys on Counter Shaft, Inches	Width of Belt to Drive Counter Shaft Inches	Speed of Counter Shaft	Floor Space Re- quired, Inches	Weight Machine Com- plete, Lbs.	Price Com- plete with R. H. Dies	Num- ber Sets Dies Fur- nished	Price Each Extra Set Dies	Price Cutting Off Knife, Extra	Price Nipple Hold- ers, Extra	Price of Oil Pump Extra
No. 6, Hand Machine	1/4 to 2	.....	.....	.....	28x 48	650	\$ 90 00	4	\$ 2 50	\$0 50	\$ 16 00	\$15 00
No. 7, Power Machine, including C. Shaft . .	1/4 to 2	12	3	200	28x 48	875	105 00	4	2 50	50	16 00	15 00
No. 7A, Hand Machine	1/4 to 3	.....	.....	.....	32x 52	1050	300 00	5	3 50	50	25 00	
No. 7B, Power Machine, including C. Shaft . .	1/4 to 3	14	4	200	36x 52	1325	325 00	5	3 50	50	25 00	
No. 8, Hand Machine	1 to 4	.....	.....	.....	28x 54	1325	400 00	4	4 00	70	35 00	
No. 9, Power Machine, including C. Shaft . .	1 to 4	14	4	200	36x 72	2500	425 00	4	4 00	70	35 00	
No. 10, with Engine attached, 5x6 Cylinder . .	1 to 4	.....	.....	.....	36x 72	2500	475 00	4	4 00	70	35 00	
No. 11, Power Machine, including C. Shaft . .	1 1/2 to 6	14	4	200	39x 72	2650	550 00	5	4 50	90	54 00	
No. 12, with Engine attached, 5x6 Cylinder . .	1 1/2 to 6	.....	.....	.....	39x 72	2800	600 00	5	4 50	90	54 00	
No. 13, Power Machine, including C. Shaft . .	2 1/2 to 8	18	4	200	44x 99	7000	900 00	6	7 00	1 00	86 00	
No. 14, with Engine attached, 6x8 Cylinder . .	2 1/2 to 8	.....	.....	.....	44x 99	7000	950 00	6	7 00	1 00	86 00	
No. 15, Power Machine, including C. Shaft . .	2 1/2 to 10	18	4	200	44x 99	8000	1,250 00	8	8 00	1 00	120 00	
No. 16, with Engine attached, 6x8 Cylinder . .	2 1/2 to 10	.....	.....	.....	44x 99	8000	1,325 00	8	8 00	1 00	120 00	
No. 17, Power Machine, including C. Shaft . .	2 1/2 to 12	18	4	200	48x120	9000	1,500 00	9	12 00	1 50	145 00	
No. 18, with Engine attached, 6x8 Cylinder . .	2 1/2 to 12	.....	.....	.....	48x120	9000	1,575 00	9	12 00	1 50	145 00	
No. 19, Power Machine, including C. Shaft . .	7 to 16	20	5	200	.....	.....	2,000 00	7	16 00	1 50	.....
No. 20, with Engine attached, 6x8 Cylinder . .	7 to 16	.....	.....	.....	.....	.....	2,100 00	7	16 00	1 50	.....

Included in Price

SAUNDERS' PIPE MACHINES.**Plate 628.**

- IXL Hand Machine, with set of Dies, $\frac{1}{4}$ to 2 inches, inclusive, Fly-wheel and set of Sockets for making Nipples, $\frac{1}{4}$ to 2 inches, weight 475 lbs., complete, each \$100 00
- IXL Power and Hand Machine, with set of Dies, $\frac{1}{4}$ to 2 inches inclusive, Fly-wheel, Pulleys, Counter-shaft and set of Sockets for making Nipples, $\frac{1}{4}$ to 2 inches, weight 675 lbs., complete, each 120 00

POWER PIPE MACHINES.

- No. 3, Screws and Cuts off Pipe $\frac{1}{4}$ to 3 inches, with Cutter Dies $2\frac{1}{2}$ and 3 inches, Solid $\frac{1}{4}$ to 2 inches, Counter-shaft and Bushings, weight 2400 lbs., complete, each 425 00
- No. 4, Screws and Cuts off Pipe 1 to 4 inches, with Cutter Dies $2\frac{1}{2}$ to 4 inches, Solid 1 to 2 inches, Counter-shaft and Bushings, weight 3100 lbs., complete, each 525 00
- No. 5, Screws and Cuts off Pipe $1\frac{1}{4}$ to 6 inches, with Solid Dies $1\frac{1}{4}$ to 2 inches, Cutter $2\frac{1}{2}$ to 6 inches, weight 4800 lbs., each 875 00
- No. 5, with Patent Dies, $1\frac{1}{4}$ to 6 inches, weight 4800 lbs., each 1,100 00
- No. 6, Screws and Cuts off Pipe $2\frac{1}{2}$ to 8 inches, with Cutter Dies $2\frac{1}{2}$ to 8 inches, weight 5600 lbs., each 1,100 00
- No. 6, Screws and Cuts off Pipe $2\frac{1}{2}$ to 8 inches, with Patent Dies $2\frac{1}{2}$ to 8 inches, weight 5600 lbs., each 1,200 00

COUNTER-SHAFTS.

- IXL, Power Machine, Pulleys $11 \times 3\frac{1}{2}$ inches, Speed 150 Revolutions.
- No. 3, Power Machine, Pulleys $14 \times 4\frac{1}{2}$ inches, Speed 200 Revolutions.
- No. 4, Power Machine, Pulleys $14 \times 4\frac{1}{2}$ inches, Speed 210 Revolutions.
- No. 5, Power Machine, Pulleys $16 \times 4\frac{1}{2}$ inches, Speed 180 Revolutions.
- No. 6, Power Machine, Pulleys $16 \times 4\frac{1}{2}$ inches, Speed 180 Revolutions.

THE NEW LITTLE GIANT SCREW PLATES.

BEVEL DIE AND COLLET,
PERFECT ADJUSTMENT.

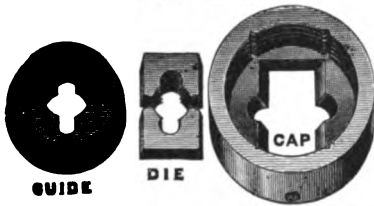


Plate 629.



Plate 630.

PRACTICABLE, STRONG,
DURABLE.

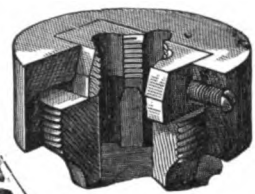


Plate 631.

LIST OF ASSORTMENTS.

Each assortment is put up in a neat wood case as shown in cut.

No. A1 has Stock and Tap Wrench, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	\$ 6 50
No. A2 has Stock and Tap Wrench, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	8 00
No. A3 has Stock and Tap Wrench, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	10 50
No. 1 has Stock 14½ inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	12 00
No. 2 has Stock 23 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	13 50
No. 3 has Stock 26 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	15 00
No. 4 has Stock 26 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	17 50
No. 5 has Stock 23 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	16 00
No. 5½ has Stock 23 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	18 50
No. 6 has Stock 26 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	22 00
No. 7 has Stock 26 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	25 50
No. 8 has Stock 14½ inches long, for first four sizes, and 26 inch Stock for the larger sizes, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	18 00
No. 9 has Stock 14½ inches long, for first four sizes, and 29-inch Stock for the larger sizes, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	27 50
No. 20 has Stock 40 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	35 00
No. 25 has Stock 52 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	45 00
No. 30 has Stock 52 inches long, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	37 50
No. 40 has Stock 23 inches long, cuts first seven sizes, 40-inch Stock for the larger sizes, cuts $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$	40 00

We furnish in all plates cutting $\frac{1}{4}$ to 1 inch, inclusive, our latest improved Adjustable Tap Wrench without extra charge. In other words, we give to each purchaser \$2.50 worth of tools for nothing.



Plate 632.

Cut showing Tap Wrench holding Taps $\frac{1}{4}$ to $\frac{3}{4}$.

LIST PRICES OF PARTS OF NEW LITTLE GIANT SCREW PLATES.

Size	No. of Thread	Tap	Die	Collet Cap	Collet Guide	Plates Nos. 1 to 9, Die and Guide	Plates Nos. 20, 40, Die and Collet	
$\frac{1}{4}$	18, 20, 24	\$0 45	1 00	0 30	20	1 50	.....	Stock 7½ in. long for collets 1¼ diam. . \$0 70
$\frac{3}{8}$	16, 18	50	1 00	30	20	1 50	.....	Stock 14½ in. long for collets 2 diam. . 1 50
$\frac{1}{2}$	14, 16, 18	55	1 25	30	20	1 75	.....	Stock 23 in. long for collets 2¾ diam. . 2 00
$\frac{5}{8}$	12, 14, 16	60	1 25	30	20	1 75	.....	Stock 26 in. long for collets 2¾ diam. . 2 00
$\frac{3}{4}$	12, 13, 14	70	1 50	30	20	2 00	.....	Stock 29 in. long for collets 2¾ diam. . 2 00
$\frac{7}{8}$	10, 11, 12	80	1 50	30	20	2 00	.....	Stock 40 in. long for collets 4 diam. . 6 00
$\frac{1}{1}$	10, 11, 12	90	1 75	30	20	2 25	3 25	Stock 52 in. long for collets 4½ diam. . 8 00
$\frac{1}{1}$	10, 11, 12	1 05	1 75	30	20	2 25	.....
$\frac{1}{1}$	10, 11, 12	1 20	2 00	30	20	2 50	3 50	
$\frac{1}{1}$	10	1 40	2 00	30	20	2 50	.....
$\frac{1}{1}$	9, 10, 12	1 60	2 75	30	20	3 25	4 25	
$\frac{1}{1}$	9	1 80	2 75	30	20	3 25	.....
$\frac{1}{1}$	8, 9	2 00	2 75	30	20	3 25	4 25	
$\frac{1}{1}$	7, 8	2 25	4 00	1 00	50	.....	5 50	
$\frac{1}{1}$	7	2 60	4 00	1 00	50	.....	5 50	
$\frac{1}{1}$	6	3 00	5 00	1 00	50	.....	6 50	
$\frac{1}{1}$	6	3 50	5 00	1 00	50	.....	6 50	

When ordering, give number of assortment you wish stocks for.

When ordering, give number of Plate repairs are for.

Collets used in No. A1 Plates are 1¼ diameter.
Collets used in No. 1 Plates are 2 diameter.
Collets used in Nos. 2 to 9 Plates are 2¾ diam.
Collets used in No. 20 Plates are 4 diameter.
Collets used in Nos. 25, 30 Plates are 4½ diam.

Unless otherwise ordered all Plates will be shipped V thread rough iron sizes. Plates exact sizes furnished at same price. Also, U. S. S. or Whitworth form of thread if desired.

THE GREEN RIVER SCREW PLATE.

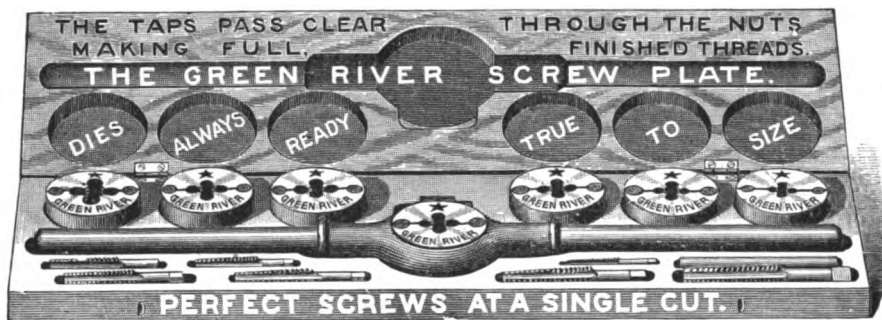


Plate 633.



Plate 634.

SET No. 1— $\frac{1}{8}$ to $\frac{1}{4}$ inch. Stock 10 inches long. With both Stock and Brace Holder for dies, 5 sizes, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ inch Taps, Dies and Guides. Complete, in case \$10 50
Single Dies, for this set, \$1.00.
Guides, 20 cents.

Diameter of Dies in this set, $1\frac{1}{8}$ in.

SET No. 1 $\frac{1}{2}$ — $\frac{1}{4}$ to $\frac{3}{4}$ in. Stock 22 in. long. 7 sizes, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$ in. Taps, Dies and Guides. Complete, in case 16 00
Diameter of Dies in this set, $2\frac{1}{4}$ in.

SET No. 3— $\frac{1}{2}$ to 1 in. Stock 29 in. long. 5 sizes, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$ in. Taps, Dies and Guides. Complete, in case 20 00

SET No. 4— $\frac{3}{4}$ to 1 in. Stock 29 inches long. 7 sizes, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$ in. Taps, Dies and Guides. Complete, in case 24 00

SET No. 5— $\frac{1}{2}$ to 1 in. Stock 29 inches long. 9 sizes, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$ in. Taps, Dies and Guides. Complete, in case 27 00

SET No. 6— $\frac{1}{2}$ to $1\frac{1}{4}$ in. Stock 35 inches long. 7 sizes, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$ in. Taps, Dies and Guides. Complete, in case 30 00

SET No. 7— $\frac{3}{8}$ to $1\frac{1}{4}$ in. Stock 35 inches long. 9 sizes, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$ in. Taps, Dies and Guides. Complete, in case 34 50

SET No. 8— $\frac{1}{4}$ to $1\frac{1}{4}$ in. Stock 35 inches long. 11 sizes, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{1}{4}$, $3\frac{1}{2}$ in. Taps, Dies and Guides. Complete, in case 38 50
Diameter of Dies in these sets $2\frac{3}{4}$ in.

Unless otherwise ordered, we will send all Screw Plates (excepting No. 0 for wire sizes) 1-32 oversizes, V thread.

Can supply Screw Plates with exact sizes V, U. S. Standard, or Franklin Institute and Whitworth form of thread at regular prices when ordered.

All parts of our Screw Plates can be duplicated from stock.

In ordering Dies, Guides, Collets or Stock, for Screw Plates, care should be taken to give number or letter of set for which parts are wanted.



Plate 635.

SET No. 9— $\frac{7}{8}$ to $1\frac{1}{2}$ in. Stock 53 inches long. 6 sizes, $\frac{7}{8}$, 1 , $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ inch, Taps, Dies and Guides. Complete, in case \$45 00
Diameter of Dies in this set $3\frac{1}{8}$ in.

SET No. 13— $\frac{1}{4}$ to 1 inch, 9 sizes. Two Stocks, one 22 inches and one 29 inches long, and $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$ in. Taps, Dies and Guides. Complete, in case 29 00

SET No. 16— $\frac{1}{4}$ to $1\frac{1}{4}$ in., 11 sizes. Two Stocks, one 22 inches long and one 35 inches long, and $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{1}{4}$, $3\frac{1}{2}$ in. Taps, Dies and Guides. Complete, in case 40 25
Diameter of Dies in these sets $1\frac{1}{8}$ and under $2\frac{1}{4}$ in. Diameter of Dies in these sets $\frac{1}{2}$ and over $2\frac{3}{4}$ in.

SET No. 25— $\frac{1}{4}$ to $1\frac{1}{2}$ inch, 13 sizes. Two Stocks, one 22 inches long and one 53 inches long, and $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{1}{4}$, $3\frac{1}{2}$, $3\frac{3}{4}$, $4\frac{1}{4}$ in. Taps, Dies and Guides. Complete, in case 61 00
Diameter of Dies in this set $\frac{3}{4}$ in. and under, $2\frac{1}{4}$ in. Diameter of Dies in this set $\frac{7}{8}$ in. and over, $3\frac{1}{8}$ in.

PRICES OF GREEN RIVER DIES (EXCEPT No. 1).

Sizes	Threads	Prices	Sizes	Threads	Prices
1-4	16, 18, 20	\$1 25	13-16	10	\$2 00
5-16	16, 18	1 25	7-8	9, 10	3 00
3-8	14, 16, 18	1 50	15-16	9	3 00
7-16	12, 14, 16	1 50	1	9	3 00
1-2	12, 13, 14	1 75	11-8	7, 8	3 75
9-16	12, 14	1 75	11-4	7	4 50
5-8	10, 11, 12	1 75	13-8	6	5 75
11-16	11, 12	1 75	11-2	6	7 00
3-4	10, 12	2 00			

In ordering Dies and Taps, state if wanted exact size (for finished iron) or 1-32 oversize (for rough iron). Also give form and number of threads wanted. Otherwise V form of thread 1-32 oversize will be sent.

All Dies stamped with a (*) are 1-32 inch oversize V form of thread.

For cutting close up to a shoulder use the face side of Die after starting the thread with the other side.

THE LIGHTNING SCREW PLATES.

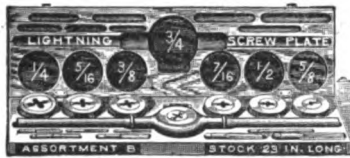


Plate 636.



Plate 637.

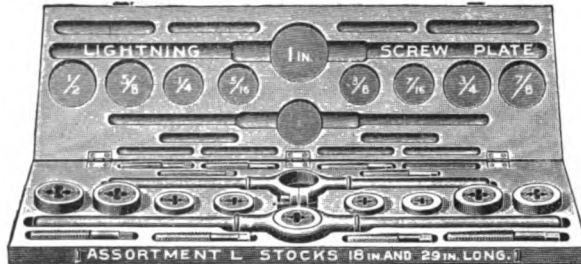


Plate 638.

SET A—3-16 to 7-16 in.; Stock 10 inches long; and 5 sizes Taps, Dies, and Guides, 3-16, 1/4, 5-16, 3/8, 7-16 inch, or for Screw Gauges, sizes 14, 16, 18, 20 and 24.
Price, complete \$9 25

SET A—Complete Set, with Taps, Dies and Guides, 3-16, 1/4, 5-16, 3/8 and 7-16 inch; Stock, Bit Brace Holder and Nut Wrenches.
Price, in case 11 25
Dies, \$1.00 each, Guides, 20 cents each.
Bit Brace Holder, for Dies, extra, 75 cents.
Diameter of Dies in this set 1 5-16 inches.

SET AA—3-16 to 1/2 inch; Stock 18 inches long; 6 sizes, 3-16, 1/4, 5-16, 3/8, 7-16, 1/2 inch Taps, Dies and Collets.
Price, complete 13 50
Outside diameter of Collets in this set, 2 3-16 inch.

SET B—1/4 to 3/4 inch; Stock 23 inches long; 7 sizes, 1/4, 5-16, 3/8, 7-16, 1/2, 5/8, 3/4 inch.
Price, complete 16 00

SET C—3/8 to 1 inch; Stock 29 inches long; 7 sizes, 3/8, 7-16, 1/2, 5/8, 3/4, 7/8, 1 inch.
Price, complete 22 00

SET C—1/4 to 1 inch; Stock 29 inches long; 9 sizes, 1/4, 5-16, 3/8, 7-16, 1/2, 5/8, 3/4, 7/8, 1 inch.
Price, complete 25 50
Diameter of Collets in these sets 2 3/4 inches.

SET D—7/8 to 1 1/2 inch; Stock 53 inches long; 6 sizes, 7/8, 1 1/8, 1 1/4, 1 1/2, 1 3/4, 1 7/8 inch.
Price, complete \$55 00
Diameter of Collets in this set 4 1/4 inches.

SET K—1/4 to 3/4 inch; 7 sizes; two Stocks, one 18 inches long, and one 23 inches long; and 1/4, 5-16, 3/8, 7-16, 1/2, 5/8, 3/4 inch Taps, Dies, and Collets.
Price, complete 18 00

SET L—1/4 to 1 inch; 9 sizes; two Stocks, one 18 inches long, and one 29 inches long; 1/4, 5-16, 3/8, 7-16, 1/2, 5/8, 3/4, 7/8, 1 inch Taps, Dies and Collets.
Price, complete 27 50
Diameter of Collets in these sets 7-16 inch, and under, 2 3-16 inches.
Diameter of Collets in these sets 1/2 inch, and over, 2 3/4 inches.

PRICES OF LIGHTNING DIES.

Size	Thread	Price	Size	Thread	Price
1-4	16, 18, 20	\$1 00	13-16	10	\$2 00
5-16	16, 18	1 00	7/8	9, 10	3 00
3/8	14, 16, 18	1 15	15-16	9	3 40
7-16	12, 14, 16	1 30	1	8	3 75
1/2	12, 13, 14	1 50	1 1/8	7, 8	4 40
9-16	12, 14	1 75	1 1/4	7	5 00
5/8	10, 11, 12	1 90	1 3/8	6	5 75
11-16	11, 12	2 10	1 1/2	6	7 00
3/4	10, 12	2 35			

THE LIGHTNING SCREW PLATES.



Plate 639.

SET No. O—With 14 sizes, 5-64 to 9-32 in.; Stock, Tap Wrench (fitting in Stock), Bit Brace Holder, and Holder for lathe use. Usual assortments 5-64, 3-32, 7-64, 1/8, 9-64, 5-32, 11-64, 3-16, 13-64, 7-32, 15-64, 1/4, 17-64, 9-32, or with Screw Gauge sizes, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16.
Price, complete, in case (either set) \$15 00

SET No. O—With Stock, Tap Wrench (fitting in Stock), and 5 sizes Taps, Dies, and Guides. Usual assortments, 1/8, 5-32, 3-16, 7-32, 1/4, or Screw Gauge sizes, 4, 6, 8, 10, 12.
Price, complete in case (either set) 5 50

SET No. O—With Stock, Tap Wrench (fitting in Stock) and 7 sizes Taps, Dies, and Guides. Usual assortments, 7-64, 1/8, 9-64, 5-32, 3-16, 7-32, 1/4, or Screw Gauge sizes, 4, 6, 8, 10, 12, 14, 16.
Price, complete in case (either set) 6 75
Stock 6 inches long; Dies 7/8 inch diameter.

SIZES OF TAPS AND DIES FURNISHED WITH No. O LIGHTNING SCREW PLATES.

Sizes	No. of Threads to in.	Sizes	No. of Threads to in.
5-64	60	3-16	24, 28, 30 and 32
3-32	48, 56 and 60	13-64	24, 28 and 32
7-64	32, 36, 40, 44, 48	7-32	22, 24, 28, 30 and 32
1/8	32, 36, 40 and 44	15-64	22, 24, 28 and 32
9-64	30, 32, 36 and 40	1/4	18, 20, 22, 24 and 32
5-32	30, 32, 36 and 40	17-64	18, 20, 24 and 32
11-64	32, 36 and 40	9-32	18, 20 and 24

SCREW GAUGE SIZES FOR MACHINE SCREWS.

Sizes	No. of Threads to in.	Sizes	No. of Threads to in.
2	48, 56 and 64	11	24, 28, and 30
3	40, 48 and 56	12	20, 22 and 24
4	32, 36 and 40	13	20 and 24
5	30, 32, 36 and 40	14	20, 22 and 24
6	30, 32, 36 and 40	15	18, 20 and 24
7	28, 30 and 32	16	16, 18, 20 and 24
8	24, 30 and 32	17	16, 18 and 20
9	24, 28, 30 and 32	18	16, 18 and 20
10	24, 28, 30 and 32		

DUPLEX DIE STOCK.

FOR THREADING BOLTS.

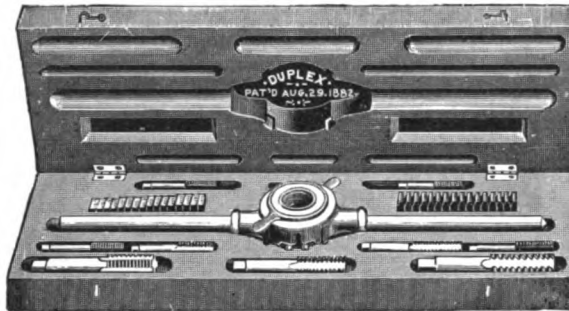


Plate 640.

The accompanying engraving shows Duplex Die Stock, fitted for Blacksmiths, Carriage Makers, Machinists and Model Makers' use. Cut can be varied $\frac{1}{8}$ either way with same set of Dies, opened and taken off without turning back. We furnish them put up in a neat wooden Case, with complete set of Dies and Taps.

FOR MACHINISTS AND MODEL MAKERS.

Size AA cuts, diameter	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$
Size AA cuts, Threads	32	24	20	18	16	14	12	10
Put up in Case, with 7 Taps and 7 sets of Dies	\$15 00							
Size A cuts, diameter	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$
Size A cuts, Threads	20	18	16	14	12	11	10	8
Put up in Case, with 8 Taps and 7 sets of Dies	\$20 00							
Size B cuts, diameter	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$
Size B cuts, Threads	20	18	16	14	12	11	10	8
Put up in Case, with 10 Taps and 9 sets of Dies	\$30 00							

FOR BLACKSMITHS AND CARRIAGE MAKERS.

Size AA cuts, diameter	$\frac{1}{8}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{3}{8}$ and $\frac{1}{2}$	$\frac{1}{2}$ and $\frac{5}{8}$	$\frac{5}{8}$ and $\frac{3}{4}$
Size AA cuts, Threads	24	18	14	12	10
Put up in Case, with 7 Taps and 4 sets of Dies	\$12 00				
Size A cuts, diameter	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{3}{8}$ and $\frac{1}{2}$	$\frac{1}{2}$ and $\frac{5}{8}$	$\frac{5}{8}$ and $\frac{3}{4}$	$\frac{3}{4}$ and $\frac{7}{8}$
Size A cuts, Threads	18	14	12	10	8
Put up in Case, with 8 Taps and 4 sets of Dies	\$17 00				
Size B cuts, diameter	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{3}{8}$ and $\frac{1}{2}$	$\frac{1}{2}$ and $\frac{5}{8}$	$\frac{5}{8}$ and $\frac{3}{4}$	$\frac{3}{4}$ and $\frac{7}{8}$
Size B cuts, Threads	18	14	12	10	8
Put up in Case, with 10 Taps and 5 sets of Dies	\$24 00				
No. 2 cuts, diameter	$\frac{1}{2}$ and $\frac{5}{8}$	$\frac{5}{8}$ and $\frac{3}{4}$	$\frac{3}{4}$ and 1	$1\frac{1}{8}$ and $1\frac{1}{4}$	$1\frac{1}{4}$ and $1\frac{1}{2}$
No. 2 cuts, Threads	12	10	8	7	6
Put up in Case, with 10 Taps and 5 sets of Dies	\$45 00				

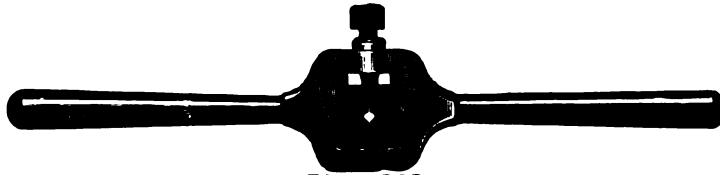
EXTRA DIES FOR DUPLEX DIE STOCK.

Size AA, right or left hand, per single set	\$1 00
Size A, right or left hand, per single set	1 25
Size B, right or left hand, per single set	1 50

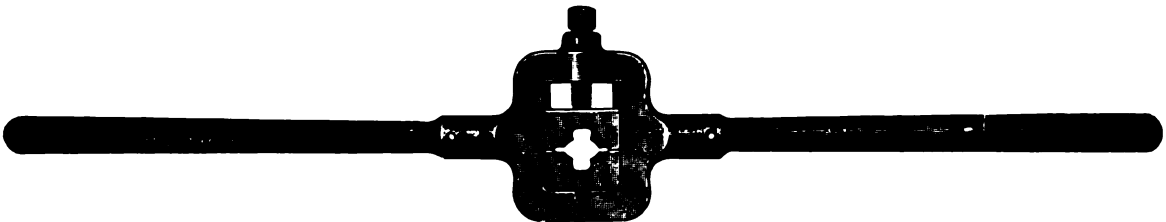
Dies for cutting Square or A Thread, 20 per cent extra.

MORSE SCREW PLATES.

No. 1 SET IN MOROCCO CASE.

**Plate 641.**The set complete, with 6 Pairs of Dies and Taps, in Morocco Case, $\frac{1}{8}$ to $\frac{1}{4}$, as cut above. \$6 75**No. 1 SCREW PLATE AND DIES.****Plate 642.**For the use of Model Makers and Jewelers, cutting $\frac{1}{8}^{18}$, $\frac{3}{16}^{40}$, $\frac{1}{4}^{32}$, $\frac{7}{32}^{24}$, $\frac{1}{2}^{20}$.

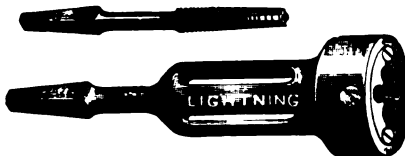
No. 1 Screw Plate, with 5 Pairs of Dies and 5 Taps, as above	\$4 50
Single Pair of Dies	50
The set complete, including Plate, Dies, Taps and Adjustable Wrench	6 00
No. 1 Plate, without Dies or Taps, entire length $6\frac{5}{8}$ inches	1 60

**Plate 643.**

Size A, with 3 Pair Dies, cutting $\frac{1}{4}^{20}$, $\frac{3}{8}^{16}$, $\frac{1}{2}^{12}$; 13 $\frac{3}{4}$ inches long.	\$ 5 00
Size B, with 4 Pair Dies, cutting $\frac{5}{16}^{16}$, $\frac{1}{2}^{12}$, $\frac{3}{4}^{11}$, $\frac{7}{8}^{10}$; 19 inches long	8 00
Size C, with 4 Pair Dies, cutting $\frac{1}{2}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$; 21 $\frac{1}{4}$ inches long	10 00
Size D, with 4 Pair Dies, cutting $\frac{3}{8}^{12}$, $\frac{1}{2}^{10}$, $\frac{5}{8}^{9}$, $\frac{3}{4}^{8}$; 28 $\frac{1}{2}$ inches long.	13 00
Size E, with 6 Pair Dies, cutting $1\frac{1}{8}^{8}$, $1\frac{1}{4}^{6}$, $1\frac{3}{8}^{5}$, $1\frac{1}{2}^{4}$, $1\frac{7}{8}^{3}$, 2^{1} ; 39 $\frac{1}{2}$ inches long	33 00
Single Pair Dies, Size No. 1	\$0 50
Single Pair Dies, Size A	1 00
Single Pair Dies, Size B	1 25
Single Pair Dies, Size C	1 75
Single Pair Dies, Size D	2 00
Single Pair Dies, Size E	3 00

Blank Dies, one-half above prices.

Screw Plates, without Dies, size	No. 1	A	B	C	D	E
Each	\$1 60	3 25	4 00	5 00	6 00	16 00

BIT BRACE COLLET AND DIE.**Plate 644.**

Collet, Tap and Die, $\frac{1}{8}$ inch.	\$2 00	Collet, Tap and Die, $\frac{3}{8}$ inch.	\$2 25
Collet, Tap and Die, $\frac{1}{4}$ inch.	2 00	Collet, Tap and Die, $\frac{1}{2}$ inch.	2 60
Collet, Tap and Die, $\frac{3}{8}$ inch.	2 00		

MACHINISTS' STOCKS AND DIES.

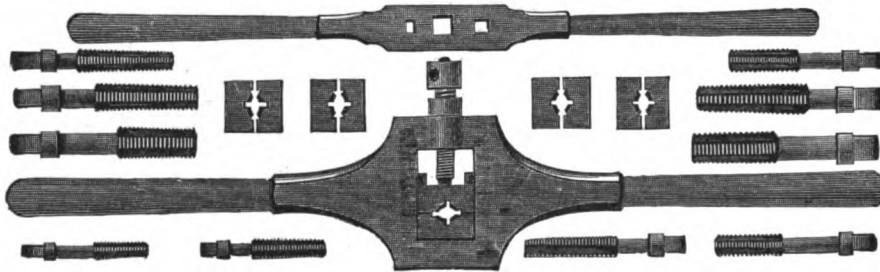


Plate 645.

K, No. 1.

OUTS 2 INCH TO 1 1/8 INCH, INCLUSIVE, RIGHT HAND.

Size, Plug and Taper Taps	2	1 3/4	1 1/2	1 3/8	1 1/4	1 1/8 in.
Number Threads to the Inch	4 1/2	5	6	6	7	7 or 8
Per Set						\$90 00

12 Taps, 6 Pair of Dies and 2 Tap Wrenches.

K, No. 2.

OUTS 1 1/2 INCH TO 7/8 INCH, INCLUSIVE, RIGHT HAND.

Size, Plug and Taper Taps	1 1/2	1 3/8	1 1/4	1 1/8	1	7/8 in.
Number Threads to the Inch	6	6	7	7 or 8	8	9
Per Set						\$40 00

12 Taps, 6 Pair of Dies and Wrench.

K, No. 3.

OUTS 1 1/4 INCH TO 3/4 INCH, INCLUSIVE, RIGHT HAND.

Size, Plug and Taper Taps	1 1/4	1 1/8	1	7/8	3/4 in.
Number Threads to the Inch	7	7 or 8	8	9	10
Per Set					\$30 00

10 Taps, 5 Pair of Dies and Wrench.

K, No. 4.

OUTS 1 INCH TO 1/2 INCH, INCLUSIVE, RIGHT HAND.

Size, Plug and Taper Taps	1	7/8	3/4	5/8	1/2 in.
Number of Threads to the Inch	8	9	10	11	12 or 13
Per Set					\$20 00

10 Taps, 5 Pair of Dies and Wrench.

K, No. 5.

OUTS 3/4 INCH TO 1/4 INCH, INCLUSIVE, RIGHT HAND.

Size, Plug and Taper Taps	3/4	5/8	1/2	3/8	1/4 in.
Number Threads to the Inch	10	11	12 or 13	16	20
Per Set					\$15 00

10 Taps, 5 Pair of Dies and Wrench.

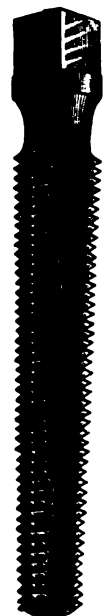
TAPER REAMER.**Plate 646.**

$\frac{1}{4}$ inch	\$0 45	$\frac{1}{8}$ inch	\$0 80
$\frac{3}{8}$ inch	50	$\frac{5}{8}$ inch	90
$\frac{1}{2}$ inch	55	$1\frac{1}{8}$ inch	1 05
$\frac{5}{8}$ inch	60	$\frac{3}{4}$ inch	1 20
$\frac{7}{8}$ inch	70		

Full Set, in Case, \$6 75.

BLACKSMITHS' PLUG AND TAPER TAPS.**Plate 647.**

Size	Hand	Threads to the Inch	Price, each Tap
$1\frac{1}{2}$ inch	R	6, 7 and 8	\$3 00
$1\frac{1}{4}$ inch	L	6, 7 and 8	3 00
$1\frac{1}{4}$ inch	R	6, 7, 8 and 9	1 75
$1\frac{1}{4}$ inch	L	8 and 9	1 75
1 inch	R	7, 8, 9 and 10	1 25
1 inch	L	8 and 9	1 25
$\frac{7}{8}$ inch	R	8, 9 and 10	90
$\frac{7}{8}$ inch	L	9	90
$\frac{3}{4}$ inch	R	7, 8, 9, 10, 12 and 14	65
$\frac{3}{4}$ inch	L	10 and 12	65
$\frac{5}{8}$ inch	R	10, 11, 12, 14 and 16	50
$\frac{5}{8}$ inch	L	10 and 12	50
$\frac{1}{2}$ inch	R	10, 12, 14 and 16	50
$\frac{1}{2}$ inch	L	12	50
$\frac{1}{2}$ inch	R	10, 12, 14, 16 and 18	40
$\frac{1}{2}$ inch	L	12 and 14	40
$\frac{1}{2}$ inch	R	10, 12, 14, 16 and 18	40
$\frac{1}{2}$ inch	L	14	40
$\frac{3}{8}$ inch	R	12, 14, 16, 18 and 20	35
$\frac{3}{8}$ inch	R	14, 16, 18, 20 and 22	30
$\frac{1}{4}$ inch	R	16, 18, 20, 22, 24 and 26	30
$\frac{1}{8}$ inch	R	24, 26 and 28	30
$\frac{1}{8}$ inch	R	30 and 32	30

**Plate 648.**



MACHINE OR NUT TAP.

V, U. S. OR WHITWORTH SHAPE OF THREAD.

Size	Whole Length	Length, Thread	No. V Threads to in.	Each
$\frac{1}{8}$	$4\frac{1}{2}$	$1\frac{7}{8}$	18, 18 and 20	\$ 0 60
$\frac{1}{4}$	$5\frac{1}{8}$	2	16 and 18	70
$\frac{3}{8}$	$5\frac{3}{4}$	$2\frac{1}{8}$	14 and 16	80
$\frac{1}{2}$	$6\frac{3}{8}$	$2\frac{1}{2}$	12, 14 and 16	90
$\frac{5}{8}$	7	$2\frac{1}{4}$	12, 13 and 14	1 00
1	$7\frac{5}{8}$	$2\frac{7}{8}$	12 and 14	1 15
$1\frac{1}{8}$	$8\frac{1}{8}$	$3\frac{1}{8}$	10, 11 and 12	1 30
$1\frac{1}{4}$	$8\frac{7}{8}$	$3\frac{1}{4}$	11 and 12	1 45
$1\frac{3}{8}$	$9\frac{1}{2}$	$3\frac{3}{4}$	10	1 60
$1\frac{1}{2}$	$10\frac{1}{8}$	$3\frac{1}{2}$	10	1 80
$1\frac{3}{4}$	$11\frac{1}{8}$	$4\frac{1}{8}$	9 and 10	2 10
$1\frac{7}{8}$	$11\frac{1}{4}$	$4\frac{1}{4}$	9	2 40
2	12	$4\frac{3}{4}$	8	2 80
$2\frac{1}{8}$	$12\frac{3}{8}$	5	7 and 8	3 20
$2\frac{1}{4}$	$13\frac{1}{4}$	$5\frac{1}{8}$	7 and 8	3 70
$2\frac{3}{8}$	$13\frac{3}{8}$	$5\frac{3}{4}$	6	4 20
$2\frac{1}{2}$	$14\frac{1}{2}$	6	6	4 70
$2\frac{3}{4}$	$15\frac{1}{8}$	$6\frac{1}{8}$	5 and $5\frac{1}{2}$	5 30
3	$15\frac{3}{4}$	$6\frac{1}{2}$	5	6 00
$3\frac{1}{8}$	$16\frac{3}{8}$	$6\frac{3}{4}$	$4\frac{1}{2}$ and 5	6 80
$3\frac{1}{4}$	17	7	$4\frac{1}{2}$	7 70
$3\frac{3}{8}$	17	8	$4\frac{1}{2}$	9 00
$3\frac{1}{2}$	18	$8\frac{1}{2}$	$4\frac{1}{2}$	10 20
$3\frac{3}{4}$	.....	.....	.....	11 50
4	19	9	4	12 50
	$19\frac{1}{2}$	$9\frac{1}{2}$	4	15 00
	21	10	$3\frac{1}{2}$	18 00
	21	$10\frac{1}{2}$	$3\frac{1}{2}$	21 50
	21	11	$3\frac{1}{4}$	25 50
	21	$11\frac{1}{2}$	3	29 50
	21	12	3	33 50

Unless advised to the contrary, we fill orders with V Threads. We keep in stock of the V Threads, $\frac{1}{32}$ over size for rough iron.

In ordering, always state exact diameter and Thread wanted. When exact Duplicates are wanted, special orders should always be accompanied by a Stub with Nut fitting same.

Plate 649.

TAP FOR MACHINE SCREWS.



Plate 650.

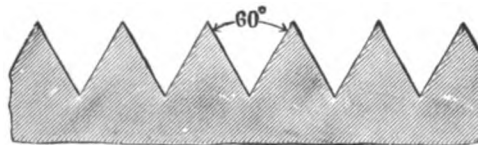
Diameter	Wire Gauge, size	Whole Length	Length, Thread	No. Threads to inch	Each	Per doz.
$\frac{1}{8}$	No. . .	$1\frac{3}{4}$	$\frac{5}{8}$	60	\$0 35	\$4 00
$\frac{1}{4}$	No. 4	$1\frac{3}{4}$	$\frac{3}{4}$	32 and 36	35	4 00
$\frac{3}{8}$	No. 6	$1\frac{3}{4}$	$\frac{3}{4}$	30, 32 and 36	35	4 00
$\frac{1}{2}$	No. . .	$1\frac{3}{4}$	$\frac{3}{4}$	30, 32, 36 and 48	35	4 00
$\frac{5}{8}$	No. 8	$1\frac{7}{8}$	$\frac{3}{4}$	30 and 32	35	4 00
$\frac{3}{4}$	No. 10	2	$\frac{7}{8}$	24, 30 and 32	35	4 00
$\frac{7}{8}$	No. 12	$2\frac{3}{8}$	1	20, 22 and 24	35	4 00
1	No. 14	$2\frac{1}{8}$	$1\frac{1}{8}$	16, 18, 20, 22 and 24	38	4 40
$1\frac{1}{8}$	No. 16	$2\frac{1}{8}$	$1\frac{1}{8}$	16, 18 and 20	38	4 40
$1\frac{1}{4}$	No. 18	$2\frac{1}{8}$	$1\frac{1}{4}$	16, 18 and 20	38	4 40
$1\frac{3}{8}$	No. 20	3	$1\frac{1}{4}$	16, 18 and 20	45	5 30
$1\frac{1}{2}$	No. 24	$3\frac{1}{8}$	$1\frac{1}{4}$	16	45	5 30

All orders for less than half-dozen of a size at single price.

MACHINISTS' HAND TAPS.**TAPER.****Plate 651.****PATENT RELIEVED.****PLUG.****Plate 652.****BOTTOMING.****Plate 653.**

Size	Whole Length	Length Thread	No. V Threads to inch	Price Each	Price per Set of 3 Taps
$\frac{1}{4}$	$2\frac{1}{8}$	$1\frac{1}{8}$	16, 18 and 20	\$0 45	1 35
$\frac{1}{8}$	$2\frac{7}{8}$	$1\frac{1}{4}$	16 and 18	50	1 50
$\frac{3}{8}$	$3\frac{1}{8}$	$1\frac{1}{4}$	14, 16 and 18	55	1 65
$\frac{1}{2}$	$3\frac{5}{8}$	$1\frac{3}{8}$	14 and 16	60	1 80
$\frac{5}{8}$	$4\frac{1}{8}$	$1\frac{3}{4}$	12, 13 and 14	70	2 10
$\frac{3}{4}$	$4\frac{1}{2}$	$1\frac{7}{8}$	12 and 14	80	2 40
$\frac{7}{8}$	$4\frac{3}{4}$	2	10, 11 and 12	90	2 70
1	$5\frac{1}{8}$	$2\frac{1}{8}$	11 and 12	1 05	3 15
$1\frac{1}{8}$	$5\frac{3}{8}$	$2\frac{1}{4}$	10, 11 and 12	1 20	3 60
$1\frac{1}{4}$	$5\frac{1}{2}$	$2\frac{3}{8}$	10	1 40	4 20
$1\frac{1}{2}$	6	$2\frac{1}{2}$	9 and 10	1 60	4 80
$1\frac{3}{4}$	$6\frac{1}{8}$	$2\frac{3}{8}$	9	1 80	5 40
$1\frac{7}{8}$	$6\frac{1}{2}$	$2\frac{7}{8}$	8	2 00	6 00
2	$6\frac{3}{8}$	3	7 and 8	2 25	6 75
$2\frac{1}{4}$	$6\frac{7}{8}$	$3\frac{1}{4}$	7	2 60	7 80
$2\frac{1}{2}$	$7\frac{1}{4}$	$3\frac{1}{2}$	6	3 00	9 00
$2\frac{3}{4}$	$7\frac{5}{8}$	$3\frac{3}{4}$	6	3 50	10 50
$2\frac{7}{8}$	$8\frac{1}{8}$	$3\frac{7}{8}$	5 and $5\frac{1}{2}$	4 20	12 60
3	$8\frac{1}{2}$	$4\frac{1}{8}$	5	5 00	15 00
$3\frac{1}{4}$	$9\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{1}{2}$ and 5	5 80	17 40
$3\frac{1}{2}$	$9\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$	6 70	20 10

We keep in stock of the V Thread the above, in exact sizes, and $\frac{1}{32}$ over size. Unless advised to the contrary, we will fill orders with V Threads.

V OR STANDARD THREAD.**Plate 654.**

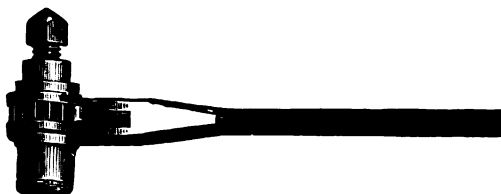
Diameter of Tap	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2 in.
No. Threads to inch	20	18	16	14	12	11	10	9	8	7	7	6	6	5	5	$4\frac{1}{2}$	$4\frac{1}{2}$

With this style of Thread the above table, by common consent, has become the standard.

These Taps we make any fraction of an inch over or under size to suit customers. All sizes and numbers of Threads to the inch not on lists, also Left Hand, are considered special, and will be charged for accordingly.

SLEEVE RATCHET.**Plate 655.**

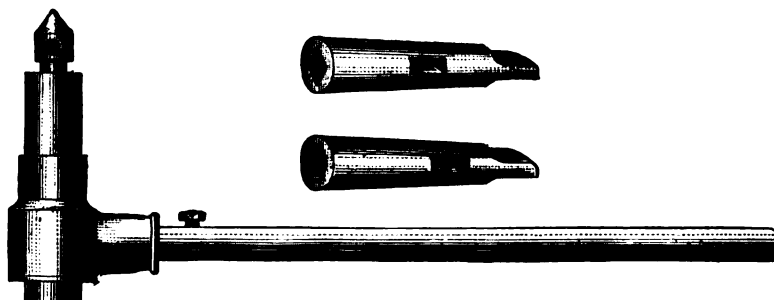
No. 1, 10 inches, each	.....	\$10 50
No. 2, 12 inches, each	.....	13 50
No. 3, 16 inches, each	.....	16 00
No. 4, 18 inches, each	.....	19 00
No. 5, 20 inches, each	.....	23 00

BOILER RATCHET.**Plate 656.**

No. 1, 10 inches, each	.....	\$ 9 00
No. 2, 12 inches, each	.....	10 50

FORBES & CURTIS' RATCHET.

FOR EITHER SQUARE OR TAPER SHANK DRILLS.

**Plate 657.**

No. 1, Boiler Ratchet, each	.....	\$7 00
No. 2, takes from $\frac{3}{8}$ to $\frac{7}{8}$ inch, inclusive	.....	6 50
No. 3, takes from $\frac{1}{2}$ to $1\frac{1}{4}$ inch, inclusive	.....	8 00

IMPROVED DUDGEON TYPE OF ROLLER TUBE EXPANDER.

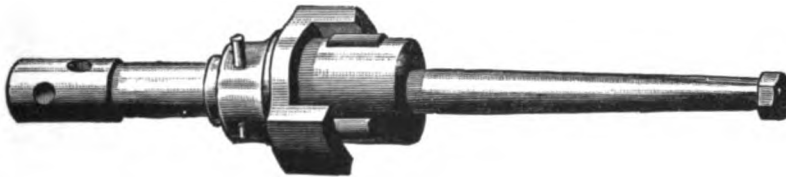


Plate 658.

This Expander has a solid body, thus avoiding constant breaking of cap screws. It is made from the best material and with great care. One Expander will answer for any thickness of tube sheet.

We carry a large stock and can ship promptly.

Diameter . .	1	1¼	1½	1¾	1⅞	2	2¼	2½	2¾ in.
List Price . .	\$10 00	10 00	10 00	10 00	10 00	10 00	12 00	14 00	16 00
Diameter . .	3	3¼	3½	3¾	4	4¼	4½	5	6 in.
List Price . .	\$18 00	20 00	23 00	25 00	30 00	35 00	40 00	50 00	60 00

SPRING TUBE EXPANDER.



Plate 659.

Size	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	4½ in.
List Price . .	\$8 00	8 00	9 00	11 00	12 00	13 00	15 00	18 00	22 00	26 00	30 00	33 00	37 00
Extra Pins .	1 00	1 25	1 50	1 75	2 00	2 25	2 50	2 75	3 00	3 25	3 50	4 00	4 50

COLLINS' TUBE EXPANDER.

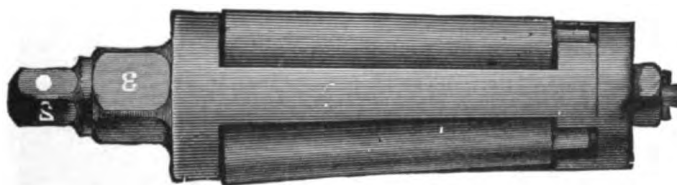


Plate 660.

Outside Diam. of Tube	1¼	1½	1¾	1⅞	2	2¼	2½	2¾	3	3¼	3½	4 in.
Each	\$12 00	12 00	14 00	14 00	15 00	18 00	20 00	21 00	22 00	24 00	28 00	35 00

CHRISTOFFEL'S ELLIPTIC SPRING TUBE SCRAPER.

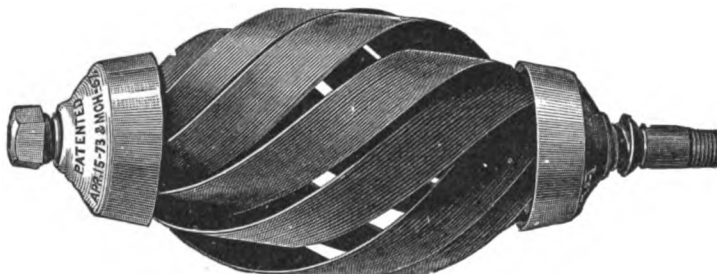


Plate 661.

Size	1	1½	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼ in. and larger
Each	\$2 00	2 00	2 00	2 25	2 50	2 75	3 00	3 25	3 50	3 75	4 00	1 25 per inch

THE ENGINEER'S FAVORITE DOUBLE-ACTING BOILER FLUE CLEANER.

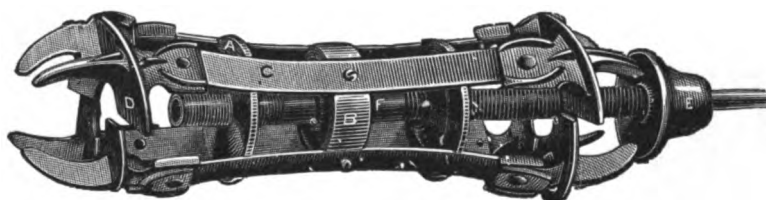


Plate 662.

Price, less than 5 inch, per inch	\$1 00
Price, 5 inch and over, per inch	1 25

THE NATIONAL STEEL TUBE CLEANER.

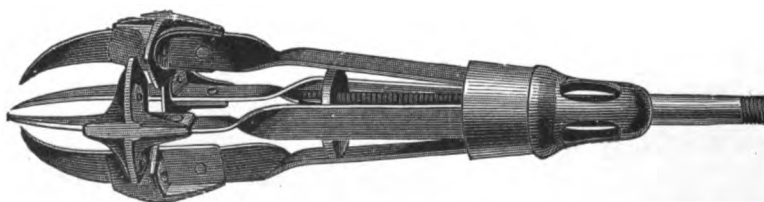


Plate 663.

Size	1	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	4½	5	5½	6 in.
Each.	\$1 00	2 00	2 00	2 00	2 25	2 50	2 75	3 00	3 25	3 50	4 00	4 50	5 00	7 00	7 50

STEAM BOILER TUBE CLEANER.

Plate 664.

No. 1, for Tubes measuring inside 1 to 1½ inches, requiring ¾ inch hose	\$7 00
No. 2, for Tubes measuring inside 1¾ to 2½ inches, requiring ¾ inch Hose	8 00
No. 3, for Tubes measuring inside 2¾ to 3¼ inches, requiring 1 inch Hose	9 00
No. 4, for Tubes measuring inside 3½ to 4 inches, requiring 1¼ inch Hose	10 00
No. 5, for Tubes measuring inside 4½ to 8 inches, requiring 1¼ inch Hose	12 00
No. 6, for Tubes measuring inside 8½ to 16 inches, requiring 1¼ inch Hose	15 00

Nos. 5 and 6 made to order from measure to fit special cases. These prices do not include Hose.

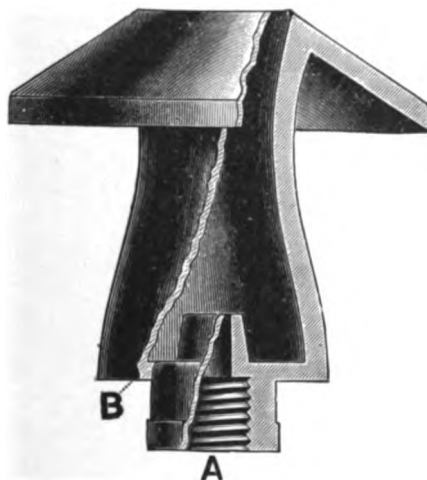


Plate 665.

CYCLONE STEAM TUBE CLEANER.

The annexed cut represents the head of a new and improved Steam Tube Cleaner. It is, without doubt, the best Steam Tube Cleaner on the market.

The steam, blowing through inlet A, causes a vacuum at mouth of Tube, which is instantly supplied by a current of air through air inlet B, giving a force that cannot be attained by other Steam Cleaners. All other Steam Tube Cleaners, when applied, create a vacuum which is not supplied, and thereby retards the velocity of the steam.

The mouth of this cleaner being larger than the neck (where steam and air is contracted to create force) causes expansion, so that all sides of Tube are acted upon.

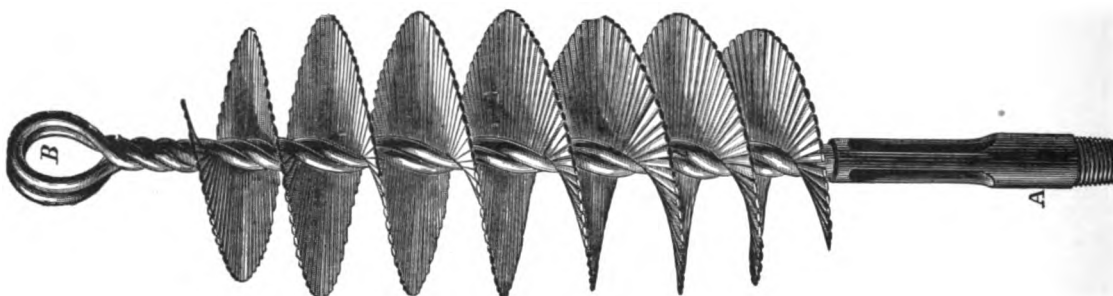


Plate 666.

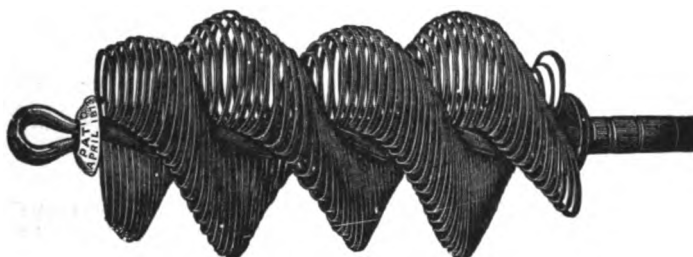
No. 1, adapted for Tubes 1½ to 3 inches diameter, each	\$ 8 00
No. 2, adapted for Tubes 3 to 6 inches diameter, each	10 00

Prices do not include Hose.

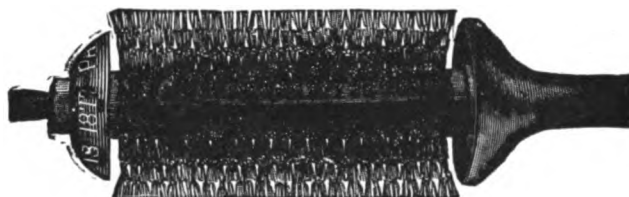
How to attach—Tap Steam Dome or Boiler, attach Hose of Cleaner to Pipe, and use ¾ inch Globe Valve when convenient.

STILLWELL'S BOILER FLUE BRUSH.**Plate 667.**

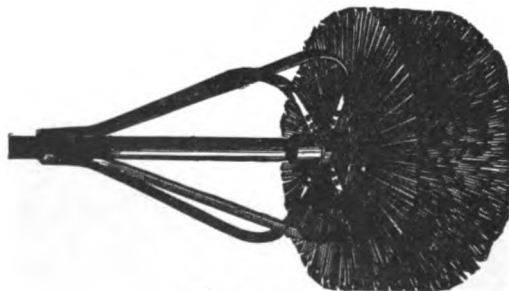
Size	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	4	4 1/2	5	5 1/2	6	7 in.
Each	\$1 35	1 45	1 55	1 70	1 90	2 10	2 30	2 50	2 80	3 00	3 30	3 75	4 00	4 25	4 50	4 75	5 50

CHRISTOFFEL'S COIL BRUSH AND FLEXIBLE SCRAPER COMBINED.**Plate 668.**

Size	1	1½	2	2¼	2½	2¾	3	3¼	3½	3¾	4 in.
Each	\$1 00	1 10	1 10	1 20	1 30	1 40	1 50	1 65	1 75	1 90	2 00

INTERNAL FLUE BRUSHES.**EXPANSION FLUE BRUSH.****Plate 669.**

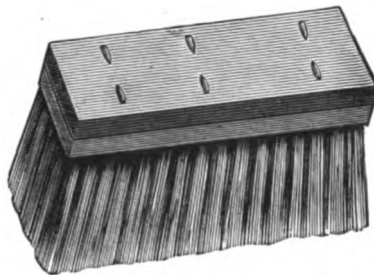
Price, per inch \$1 00
 Sizes smaller than 2 inches, same price as 2 inch. Made in sizes from 1 1/2 to 9 inches.

LARGE FLUE BRUSH.**Plate 670.**

Price, per inch \$1 00
 Made in sizes 10 to 36 inches.

CASTING BRUSH.

FOUR ROW.

**Plate 671.**

Length of Wire	2	2½	3	3½	4	4½	5	6 in.
Price, per doz	\$5 50	5 75	6 00	6 25	6 50	6 75	7 00	7 50

Five and Six Row Brushes will be furnished at an advance of 25 and 50 per cent, respectively.

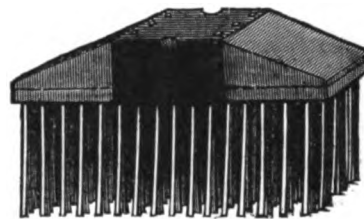
CASTING BRUSH.

WITH HANDLE.

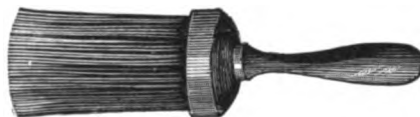
FOUR ROW.

**Plate 672.**

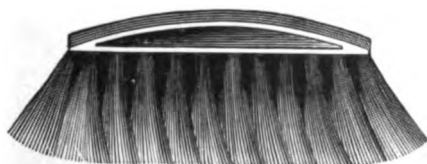
Length of Wire. 2½	3	4	5 in.
Price, per doz . \$6 00	6 50	7 00	7 50

SWEEPING BROOM.**Plate 673.**

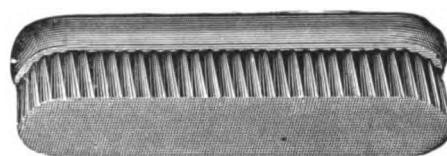
10 inch, per doz.	\$ 8 00
12 inch, per doz.	10 00
14 inch, per doz.	12 00
16 inch, per doz.	14 00
18 inch, per doz.	16 00

ROUND CASTING BRUSH,**Plate 674.**

Length of Wire	4	5	6	7 in.
Price, per doz.	\$4 50	4 50	5 00	5 50

MOLDERS' SOFT BRUSH.**Plate 675.**

No. 1, each \$0 60

MOLDERS' HARD BRUSH.**Plate 676.**

No. 1, each \$0 40

METALS.**SOLDER.****Plate 677.****BABBITT METAL.****Plate 678.****MACHINE PRESSED BAR LEAD.****Plate 679.****Plate 680.****Plate 681.****Plate 682.****Plate 683.****Plate 684.**

We are headquarters for Metals.

DIXON'S PURE PLUMBAGO CRUCIBLES.



Plate 685.

Number	Height Outside, Inches	Diameter at the Top Outside, Inches	Diameter at the Blige Outside, Inches	Diameter at the Bottom Outside, Inches	Weight of the Crucible,		Capacity of the Crucible by Weight of Water,		Prices
					Lbs.	Oz.	Lbs.	Oz.	
1	3 1/4	2 1/2	2 3/8	1 5/8	...	9	...	4 1/4	each, \$0 30
2	3 3/4	2 7/8	3	2 3/4	...	12	...	6 1/2	each, 36
3	4 1/2	3 1/2	3 3/8	2 3/4	1	8	...	11	each, 42
4	5	4	4 1/8	3	1	13	1	...	each, 48
5	5 1/4	4 1/4	4 1/8	3 1/8	2	4	1	4	each, 54
6	5 3/4	4 1/2	4 3/4	3 3/8	2	12	1	12	each, 60
7	6 1/4	4 7/8	5	3 1/2	3	3	2	...	each, 66
8	6 1/2	5	5 1/8	3 5/8	3	8	2	4	each, 70
10	7 3/8	5 1/8	5 3/4	4 1/4	4	12	3	...	each, 80
12	8	6	6 1/4	4 3/4	6	8	4	8	each, 90
14	8 3/8	6 3/4	7 1/8	5 3/8	8	8	5	4	No. 14 and upward, 7 cts. per Number.
16	9	7	7 1/2	5 3/4	9	4	6	4	
18	9 1/4	7 1/4	7 3/4	5 7/8	10	4	7	4	
20	9 3/4	7 5/8	8 1/4	6	12	8	8	12	
25	10 1/4	8	8 5/8	6 1/2	14	4	10	4	
30	11 1/4	8 1/2	9 1/4	6 3/4	15	12	13	...	
35	11 3/4	9 1/8	9 7/8	7 1/4	20	...	15	8	
40	12 1/4	9 1/4	10 1/4	7 3/4	23	...	18	...	
45	13	9 5/8	10 1/2	7 3/4	24	...	20	...	
50	13 5/8	9 3/4	10 3/4	7 7/8	27	8	22	...	
60	13 3/4	10 3/8	11 1/8	8	30	...	24	...	
70	14 1/2	10 3/4	11 1/8	8 1/8	33	...	26	4	
80	15	10 7/8	12	8 3/4	37	8	29	...	
100	16	11 1/2	12 1/2	9	45	...	32	4	
125	16 1/2	12 1/2	13 3/4	9 7/8	51	12	43	8	
150	18	12 3/4	14 1/8	10 1/8	63	...	51	8	
200	19 3/4	14 1/4	15 3/4	10 3/4	76	...	69	8	
300	21	15 1/2	17	11 1/2	93	...	80	8	

COVERS.

No. 1, each	\$0 20
No. 2, each	20
No. 3, each	20
No. 4, each	20

No. 5, each	\$0 20
No. 6, each	30
No. 8, each	30
No. 10, each	30

No. 12, each	\$0 36
No. 14, each	36
No. 16, each	36
No. 18 and upward, per No. 02	

SHEET AND BOLT COPPER.

SIZE OF SHEETS		64 oz. & over. 50 lb. sheet, 30x60 and heavier	32 oz. to 64 oz. 25 to 50 lb. sheet, 30x60	24 oz. to 32 oz. 18½ to 25 lb. sheet, 30x60	16 oz. to 24 oz. 12½ to 18½ lb. sheet, 30x60	14 oz. and 15 oz. 11 to 12½ lb. sheet, 30x60	12 oz. and 13 oz. 9½ to 11 lb. sheet, 30x60	10 oz. and 11 oz. 7½ to 9½ lb. sheet, 30x60	8 oz. and 9 oz. 6½ to 7½ lb. sheet, 30x60	Lighter than 8 oz.
Widths	Lengths									
Not wider than 30 in.	not longer than 72 in. .	16	16	16	16	17	18	19	22	25
	longer than 72 in., not longer than 96 in. . .	16	16	16	16	17	19	22	25	...
	longer than 96 in. . .	16	16	16	16	18	22	...	...	...
Wider than 30 in., but not wider than 36 inches.	not longer than 72 in. .	16	16	16	16	18	20	23	26	...
	longer than 72 in., not longer than 96 in. . .	16	16	16	16	18	22	25	...	...
	longer than 96 in., not longer than 120 in. . .	16	16	16	17	19	...	...	...	...
Wider than 36 in., but not wider than 48 in.	longer than 120 in. . .	16	16	17	18	...	...	...	...	...
	not longer than 72 in. .	16	16	17	18	20	23	26	...	...
	longer than 72 in., not longer than 96 in. . .	16	16	17	19	21	24	...	...	...
Wider than 48 in., but not wider than 60 in.	longer than 96 in., not longer than 120 in. . .	16	16	18	20	24	...	...	...	...
	longer than 120 in. . .	16	17	19	22	...	...	...	...	...
	not longer than 72 in. .	16	16	17	19	22	27	...	...	...
Wider than 60 in., but not wider than 72 in.	longer than 72 in., not longer than 96 in. . .	16	16	18	20	25	...	...	...	...
	longer than 96 in., not longer than 120 in. . .	16	17	19	22	...	...	...	...	...
	longer than 120 in. . .	16	18	20	24	...	...	...	...	...
Wider than 72 in., but not wider than 108 in.	not longer than 96 in. .	16	17	19	24	...	...	...	...	...
	longer than 96 in., not longer than 144 in. . .	16	18	21	26	...	...	...	...	...
	longer than 144 in. . .	17	19	24	...	...	...	...	...	...
Wider than 108 in.	not longer than 120 in. .	17	19	25	...	...	...	...	...	...
	longer than 120 in. . .	19	20	...	...	...	...	...	...	...
Wider than 108 in.	not longer than 144 in. .	20	22	...	...	...	...	...	...	...
	longer than 144 in. . .	21	24	...	...	...	...	...	...	...

Bolt Copper, $\frac{3}{8}$ inch diameter and over, per pound \$0 16

Circles, Segments and Pattern Sheets, 3 cents per pound advance over price of Sheet Copper required to cut them from. Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one cent per pound over the foregoing prices. Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two cents per pound over the foregoing prices. All Polished Copper, 20 inches wide and under, one cent per pound advance over the price for Cold Rolled Copper. All Polished Copper, over 20 inches wide, two cents per pound advance over the price for Cold Rolled Copper.

TINNING.

Tinning Sheets, on one side, 10, 12 and 14 x 48, each	\$0 6
Tinning Sheets, on side, 30 x 60, each	25
For Tinning Boiler Sizes, 9 inch (Sheets, 14 x 60), each	12
For Tinning Boiler Sizes, 8 inch (Sheets, 14 x 56), each	10
For Tinning Boiler Sizes, 7 inch (Sheets, 14 x 52), each	8
Tinning Sheets, on one side, other sizes, per square foot	2

For Tinning both sides, double the above prices.

NEW PROCESS TWIST DRILLS.

FITTING COE'S BLACKSMITHS' DRILL PRESS.

No. II0.



Plate 686.

Diameter, Inches	Length, Inches	Each	Diameter, Inches	Length, Inches	Each	Diameter, Inches	Each
$\frac{1}{8}$	4 $\frac{7}{8}$	\$0 55	$\frac{3}{8}$	6	\$1 05	1 $\frac{3}{8}$	\$2 30
$\frac{1}{4}$	5 $\frac{3}{8}$	60	$\frac{1}{2}$	6	1 15	1 $\frac{1}{2}$	2 40
$\frac{3}{8}$	6	70	$\frac{3}{4}$	6	1 25	1 $\frac{5}{8}$	2 65
$\frac{1}{2}$	6	75	$1\frac{1}{8}$	6	1 35	1 $\frac{3}{4}$	2 80
$\frac{5}{8}$	6	85	$\frac{7}{8}$	6	1 45	1 $\frac{7}{8}$	2 95
$1\frac{1}{8}$	6	90	$1\frac{1}{4}$	6	1 60	1 $\frac{1}{2}$	3 10
$1\frac{1}{4}$	6	95	1	6	1 80		
$1\frac{3}{8}$	6	1 00	$1\frac{1}{8}$	6	2 20		

The above Drills have shanks 2 $\frac{1}{4}$ inches long and about $\frac{1}{4}$ inch diameter.

FITTING THE PRENTICE OR WORCESTER BLACKSMITHS' DRILL PRESS.

No. III.



Plate 687.

Diameter, Inches	Length, Inches	Each	Diameter, Inches	Length, Inches	Each
$\frac{1}{8}$	5 $\frac{1}{8}$	\$0 45	$1\frac{7}{8}$	7 $\frac{1}{4}$	\$0 90
$\frac{1}{4}$	5 $\frac{3}{8}$	45	$1\frac{1}{2}$	7 $\frac{1}{2}$	95
$\frac{3}{8}$	5 $\frac{5}{8}$	50	$\frac{1}{2}$	7 $\frac{3}{4}$	1 00
$\frac{1}{2}$	5 $\frac{7}{8}$	55	$1\frac{1}{4}$	8	1 10
$\frac{3}{4}$	6 $\frac{1}{8}$	60	$1\frac{3}{4}$	8 $\frac{1}{4}$	1 20
$1\frac{1}{8}$	6 $\frac{1}{4}$	65	$1\frac{1}{2}$	8 $\frac{1}{2}$	1 30
$1\frac{1}{4}$	6 $\frac{3}{8}$	70	$\frac{3}{8}$	8 $\frac{3}{4}$	1 40
$1\frac{1}{2}$	6 $\frac{1}{2}$	75	$1\frac{1}{4}$	9	1 50
$1\frac{3}{4}$	6 $\frac{3}{4}$	80	$1\frac{1}{2}$	9 $\frac{1}{4}$	1 60
$1\frac{1}{2}$	7	85	$\frac{3}{4}$	9 $\frac{3}{4}$	1 85

The above Drills have shanks 2 $\frac{1}{2}$ inches long and $\frac{1}{2}$ inch diameter.**DRILLS.**

FITTING SILVER AND DEMING'S BLACKSMITHS' DRILL PRESS.

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$
Length.	4 $\frac{7}{8}$	5 $\frac{3}{8}$	6	6	6	6	6	6	6 in.
Each	\$0 50	55	60	70	75	80	85	90	1 05

Nos. 1 and 2 with shanks $\frac{1}{2}$ inch diameter.Drills larger than $\frac{1}{4}$ inch with shanks $\frac{1}{2}$ inch diameter, and Drills with shanks about $\frac{1}{4}$ inch diameter, fitting Silver & Deming's Press No. 3 and 4, same price as for Coe's Drill Press.All Drills larger than $\frac{1}{8}$ inch are 6 inches entire length. Shanks 2 $\frac{1}{4}$ inches long.

NEW PROCESS TAPER SHANK TWIST DRILL.



Plate 688.

Diameter	Length	Price Each	No. of Socket	Diameter	Length	Price Each	No. of Socket
$\frac{1}{4}$	$6\frac{1}{8}$	\$0 60	No. 1.	$1\frac{3}{4}$	$14\frac{1}{8}$	\$ 4 65	No. 4.
$\frac{3}{8}$	$6\frac{1}{4}$	65		$1\frac{1}{2}$	$14\frac{1}{4}$	4 80	
$\frac{1}{2}$	$6\frac{3}{8}$	70		$1\frac{1}{4}$	$14\frac{3}{8}$	5 00	
$\frac{5}{8}$	$6\frac{1}{2}$	75		$1\frac{3}{8}$	$14\frac{1}{2}$	5 20	
$\frac{3}{4}$	$6\frac{3}{4}$	80		$1\frac{1}{2}$	$14\frac{3}{4}$	5 40	
$\frac{7}{8}$	7	85		$1\frac{1}{4}$	$14\frac{1}{2}$	5 60	
1	$7\frac{1}{4}$	90		$1\frac{3}{4}$	$14\frac{7}{8}$	5 80	
$1\frac{1}{8}$	$7\frac{1}{2}$	95		$1\frac{1}{2}$	15	6 00	
$1\frac{1}{4}$	$7\frac{3}{4}$	1 00		$1\frac{1}{4}$	$15\frac{1}{8}$	6 30	
$1\frac{3}{8}$	8	1 10		$1\frac{3}{8}$	$15\frac{1}{4}$	6 60	
$1\frac{1}{2}$	$8\frac{1}{4}$	1 20	No. 2.	$1\frac{1}{2}$	$15\frac{3}{8}$	6 90	No. 5.
$1\frac{3}{4}$	$8\frac{1}{2}$	1 30		$1\frac{3}{4}$	$15\frac{1}{2}$	7 20	
2	$8\frac{3}{4}$	1 40		$1\frac{1}{2}$	$15\frac{5}{8}$	7 50	
$2\frac{1}{8}$	9	1 50		$1\frac{3}{4}$	$15\frac{3}{4}$	7 80	
$2\frac{1}{4}$	$9\frac{1}{4}$	1 60		$1\frac{1}{2}$	$15\frac{7}{8}$	8 10	
$2\frac{3}{8}$	$9\frac{1}{2}$	1 70		$1\frac{3}{4}$	16	8 40	
$2\frac{1}{2}$	$9\frac{3}{4}$	1 85		$1\frac{1}{2}$	$16\frac{1}{8}$	8 60	
$2\frac{3}{4}$	$9\frac{7}{8}$	2 00		$1\frac{3}{4}$	$16\frac{1}{4}$	8 80	
3	10	2 15		$1\frac{1}{2}$	$16\frac{3}{8}$	9 00	
$3\frac{1}{8}$	$10\frac{1}{4}$	2 30		$1\frac{3}{4}$	$16\frac{1}{2}$	9 20	
$3\frac{1}{4}$	$10\frac{1}{2}$	2 45	No. 3.	$1\frac{1}{2}$	$16\frac{5}{8}$	9 35	No. 5.
$3\frac{3}{8}$	$10\frac{3}{8}$	2 60		$1\frac{3}{4}$	$16\frac{1}{2}$	9 50	
$3\frac{1}{2}$	$10\frac{3}{4}$	2 75		$1\frac{1}{2}$	$16\frac{3}{4}$	9 65	
$3\frac{3}{4}$	$10\frac{7}{8}$	2 90		$1\frac{3}{4}$	$16\frac{7}{8}$	9 80	
4	11	3 00		2	$16\frac{1}{2}$	10 20	
$4\frac{1}{8}$	$11\frac{1}{8}$	3 20		$2\frac{1}{8}$	17	10 60	
$4\frac{1}{4}$	$11\frac{1}{4}$	3 40		$2\frac{1}{4}$	17	11 20	
$4\frac{3}{8}$	$11\frac{1}{2}$	3 60		$2\frac{1}{2}$	17	12 00	
$4\frac{1}{2}$	$11\frac{3}{4}$	3 80		$2\frac{3}{4}$	$17\frac{1}{2}$	12 80	
$4\frac{3}{4}$	$11\frac{7}{8}$	4 00		$2\frac{1}{2}$	$17\frac{1}{2}$	13 60	
5	12	4 20		$2\frac{3}{8}$	18	14 40	
$5\frac{1}{8}$	$12\frac{1}{8}$	4 40		$2\frac{1}{2}$	$18\frac{1}{2}$	15 00	
$5\frac{1}{4}$	$12\frac{1}{2}$	4 50		$2\frac{1}{2}$	19	15 60	

The above we furnish by 64ths if ordered. See page 271.

TAPER SQUARE SHANK DRILL FITTING RATCHET.

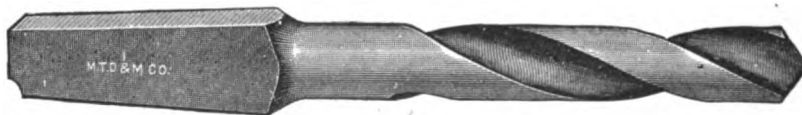


Plate 689.

With Shanks $\frac{5}{8}$ inch by $\frac{3}{8}$ inch and $1\frac{1}{2}$ inch long, and Shanks $\frac{3}{4}$ inch by $\frac{1}{2}$ inch and $1\frac{3}{4}$ inch long.

Diameter	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$ in.
Length	5	5	5	5	6	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$ in.
Price	\$1 00	1 05	1 10	1 15	1 20	1 25	1 25	1 30	1 30	1 35	1 40	
Diameter	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$ in.
Length	$6\frac{1}{2}$	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	$8\frac{3}{4}$	9	$9\frac{1}{4}$	$9\frac{1}{4}$	$9\frac{1}{4}$	$9\frac{1}{4}$ in.
Price	\$1 45	1 55	1 75	2 05	2 30	2 55	2 85	3 10	3 25	3 55		

NEW PROCESS TAPER SHANK TWIST DRILL.

64TH SIZES, FOR REAMERS.



Plate 690.

Diameter	Length	Each	No. of Socket	Diameter	Length	Each	No. of Socket
$\frac{1}{8}$	$6\frac{1}{8}$	\$0 60	No. 1, \$1 20	$\frac{1}{8}$	$10\frac{3}{4}$	\$2 75	No. 3, \$2 50
$\frac{1}{4}$	$6\frac{1}{4}$	65		$\frac{1}{4}$	$10\frac{7}{8}$	2 90	
$\frac{3}{8}$	$6\frac{3}{8}$	70		$\frac{3}{8}$	11	3 00	
$\frac{1}{2}$	$6\frac{1}{2}$	75		$1\frac{1}{8}$	$11\frac{1}{8}$	3 20	
$\frac{5}{8}$	$6\frac{3}{4}$	80		$1\frac{1}{4}$	$11\frac{1}{4}$	3 40	
$\frac{3}{4}$	7	85		$1\frac{3}{8}$	$11\frac{1}{2}$	3 60	
$\frac{7}{8}$	$7\frac{1}{4}$	90		$1\frac{1}{2}$	$11\frac{3}{4}$	3 80	
$1\frac{1}{8}$	$7\frac{1}{2}$	95		$1\frac{3}{4}$	$11\frac{7}{8}$	4 00	
$1\frac{1}{4}$	$7\frac{3}{4}$	1 00		$1\frac{7}{8}$	12	4 20	
$1\frac{3}{8}$	8	1 10		$1\frac{1}{2}$	$12\frac{1}{8}$	4 40	
$1\frac{1}{2}$	$8\frac{1}{4}$	1 20		$1\frac{3}{4}$	$12\frac{1}{2}$	4 50	
$1\frac{3}{4}$	$8\frac{1}{2}$	1 30		$1\frac{7}{8}$	$14\frac{1}{8}$	4 65	
$1\frac{7}{8}$	$8\frac{3}{4}$	1 40		$1\frac{1}{2}$	$14\frac{1}{4}$	4 80	
$2\frac{1}{8}$	9	1 50		$1\frac{3}{4}$	$14\frac{3}{8}$	5 00	
$2\frac{1}{4}$	$9\frac{1}{4}$	1 60		$1\frac{7}{8}$	$14\frac{1}{2}$	5 20	
$2\frac{3}{8}$	$9\frac{1}{2}$	1 70	No. 2, \$1 80	$1\frac{1}{2}$	$14\frac{5}{8}$	5 40	No. 4, \$4 00
$2\frac{1}{2}$	$9\frac{3}{4}$	1 85		$1\frac{3}{4}$	$14\frac{3}{4}$	5 60	
$2\frac{7}{8}$	$9\frac{7}{8}$	2 00		$1\frac{7}{8}$	$14\frac{7}{8}$	5 80	
$3\frac{1}{8}$	10	2 15		$1\frac{1}{2}$	15	6 00	
$3\frac{1}{4}$	$10\frac{1}{4}$	2 30		$1\frac{3}{4}$	$15\frac{1}{8}$	6 30	
$3\frac{3}{8}$	$10\frac{1}{2}$	2 45		$1\frac{7}{8}$	$15\frac{1}{4}$	6 60	
$3\frac{7}{8}$	$10\frac{3}{8}$	2 60		$1\frac{1}{2}$	$15\frac{3}{8}$	6 90	

BIT STOCK DRILL

No. 109, FOR METAL OR WOOD.



Plate 691.

Diameter	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{1}{8}$
Per doz .	\$1 50	1 65	2 10	2 60	3 10	3 60	4 10	4 70	5 40	6 30	7 20	8 00
Each . .	14	16	20	24	29	33	38	43	48	54	62	68

Diameter	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	1 in.
Per doz .	\$8 80	9 60	10 30	11 00	.....	.....	.....	.....	.....	.....	.....	.....
Each . .	75	82	87	92	1 20	1 35	1 50	1 65	1 80	1 95	2 15	2 35

Our Bit Stock Drills will fit any Brace in the market, and will drill steel, iron or other metal, as well as wood. They are not injured by contact with screws or nails, and will bore straight any kind of wood without splitting it.

NEW PROCESS STRAIGHT SHANK TWIST DRILL



Plate 692.

JOBBER'S' AND MACHINISTS' SETS.

LETTER SIZES.

No. 105.

Diameter, Inches	Length, Inches	Price, per doz.	Price, Each
$\frac{1}{8}$	$2\frac{1}{2}$	\$1 00	\$0 09
$\frac{3}{16}$	$2\frac{5}{8}$	1 10	10
$\frac{1}{4}$	$2\frac{3}{4}$	1 20	11
$\frac{5}{16}$	$2\frac{7}{8}$	1 30	12
$\frac{3}{8}$	3	1 45	13
$\frac{7}{16}$	$3\frac{1}{8}$	1 60	15
$\frac{1}{2}$	$3\frac{1}{4}$	1 80	16
$\frac{9}{16}$	$3\frac{3}{8}$	2 00	18
$\frac{5}{8}$	$3\frac{1}{2}$	2 20	20
$\frac{11}{16}$	$3\frac{5}{8}$	2 40	21
$\frac{3}{4}$	$3\frac{3}{4}$	2 65	23
$\frac{7}{8}$	$3\frac{7}{8}$	2 90	26
$1\frac{1}{4}$	4	3 15	28
$1\frac{1}{2}$	$4\frac{1}{8}$	3 40	30
$1\frac{3}{4}$	$4\frac{1}{4}$	3 65	32
2	$4\frac{3}{8}$	3 90	35
$2\frac{1}{4}$	$4\frac{1}{2}$	4 20	37
$2\frac{1}{2}$	$4\frac{5}{8}$	4 50	40
$2\frac{3}{4}$	$4\frac{3}{4}$	4 80	42
3	$4\frac{7}{8}$	5 10	45
$3\frac{1}{8}$	5	5 40	48
$3\frac{1}{4}$	$5\frac{1}{8}$	5 70	50
$3\frac{1}{2}$	$5\frac{1}{4}$	6 00	53
$3\frac{3}{4}$	$5\frac{3}{8}$	6 40	55
4	$5\frac{1}{2}$	6 80	59
$4\frac{1}{4}$	$5\frac{5}{8}$	7 20	63
$4\frac{1}{2}$	$5\frac{3}{4}$	7 50	65
$4\frac{3}{4}$	$5\frac{7}{8}$	7 75	67
5	6	8 00	70

No. 106.

Diameter,	Length,	Price,	Price,
Inches	Inches	per doz.	Each
A	$3\frac{1}{8}$	\$2 90	\$0 26
B	$3\frac{1}{8}$	3 00	27
C	$3\frac{1}{8}$	3 10	28
D	$3\frac{1}{8}$	3 20	29
E	$3\frac{1}{8}$	3 30	30
F	$4\frac{1}{4}$	3 40	30
G	$4\frac{1}{4}$	3 50	31
H	$4\frac{1}{4}$	3 60	32
I	$4\frac{1}{4}$	3 70	33
J	$4\frac{1}{4}$	3 80	34
K	$4\frac{1}{4}$	3 90	35
L	$4\frac{1}{4}$	4 00	36
M	$4\frac{1}{4}$	4 10	36
N	$4\frac{1}{4}$	4 20	37
O	$4\frac{1}{4}$	4 30	38
P	$4\frac{3}{8}$	4 40	39
Q	$4\frac{3}{4}$	4 60	40
R	$4\frac{3}{4}$	4 80	42
S	$4\frac{7}{8}$	5 00	44
T	$4\frac{7}{8}$	5 20	45
U	5	5 40	47
V	5	5 60	49
W	$5\frac{1}{8}$	5 80	51
X	$5\frac{1}{4}$	6 00	53
Y	$5\frac{1}{2}$	6 40	55
Z	$5\frac{3}{8}$	6 80	59

For very exact work, a gauge plainly marked should accompany an order.

STUBS' STEEL WIRE GAUGE DRILLS.

No. 107.

Numbers, by Gauge	Length, Inches	Price, per doz.	Price, Each	Numbers, by Gauge	Length, Inches	Price, per doz.	Price, Each
1 to 5	4	\$2 35	\$0 22	31 to 35	$2\frac{3}{8}$	\$1 40	\$0 14
6 to 10	$3\frac{1}{8}$	2 25	21	36 to 40	$2\frac{1}{2}$	1 25	12
11 to 15	$3\frac{1}{2}$	2 10	20	41 to 45	$2\frac{1}{4}$	1 10	10
16 to 20	$3\frac{1}{4}$	1 95	19	46 to 60	$2\frac{1}{8}$ to $1\frac{3}{4}$	95	9
21 to 25	$3\frac{1}{8}$	1 75	17	61 to 70	$1\frac{1}{2}$	90	8
26 to 30	$2\frac{1}{8}$	1 55	15	71 to 80	$1\frac{1}{8}$ to $\frac{3}{4}$	1 00	9

STEEL SOCKETS FOR TAPER SHANK DRILLS.

No. 100 TAPER SOCKET.



Plate 693.

No. 1, holds $\frac{1}{4}$ to $\frac{1}{2}$ inches, inclusive, each	\$1 20
No. 2, holds $\frac{5}{8}$ to $\frac{3}{4}$ inches, inclusive, each	1 80
No. 3, holds $\frac{1}{2}$ to $1\frac{1}{4}$ inches, inclusive, each	2 50
No. 4, holds $1\frac{1}{2}$ to 2 inches, inclusive, each	4 00
No. 5, holds $2\frac{1}{8}$ to $2\frac{1}{2}$ inches, inclusive, each	7 50

No. 100 A.



Plate 694.

No. 1, with Shank fitted to No. 2 or 3 Socket, each	\$2 00
No. 2, with Shank fitted to No. 3 Socket, each	2 50
No. 3, with Shank fitted to No. 4 Socket, each	3 20
No. 4, with Shank fitted to No. 5 Socket, each	4 80

No. 100 B.

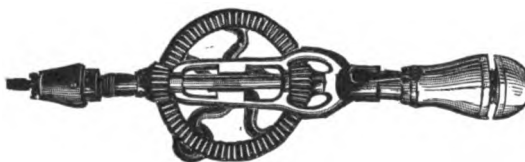


Plate 695.

No. 1, fitted to No. 2 or 3 Socket, each	\$1 80
No. 2, fitted to No. 3 Socket	2 40
No. 3, fitted to No. 4 Socket	3 00
No. 4, fitted to No. 5 Socket	4 40

HAND DRILL.

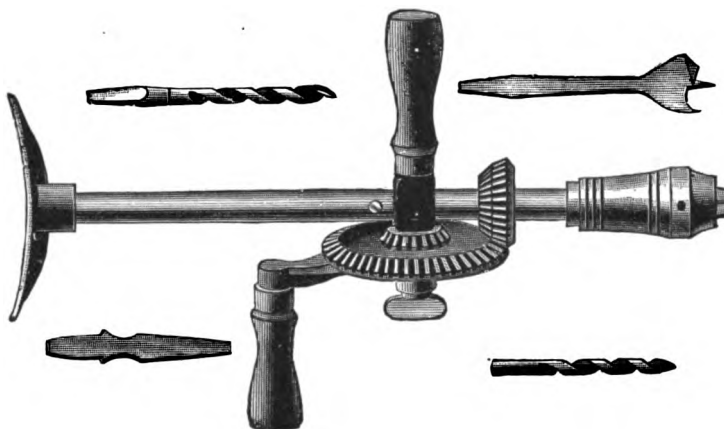
No. 1.

**Plate 696.**

No. 1, Single Gear, Hollow Handle, Nickel-Plated, per doz \$15 00
 No. 1-B, Double Gear, same Chuck 18 00

BREAST DRILL.

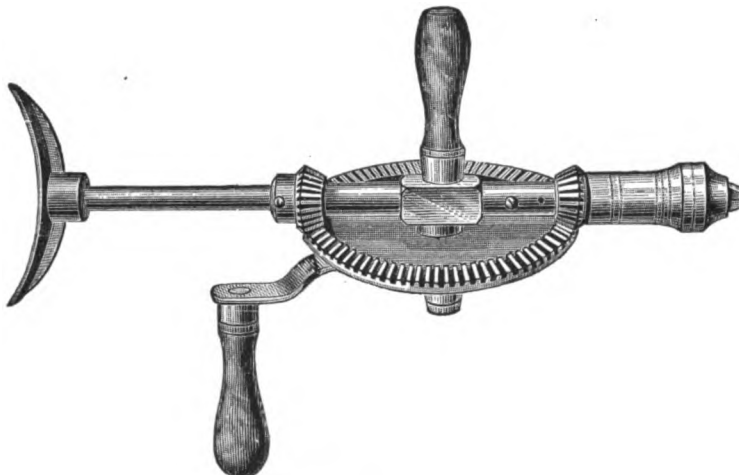
No. 10.

**Plate 697.**

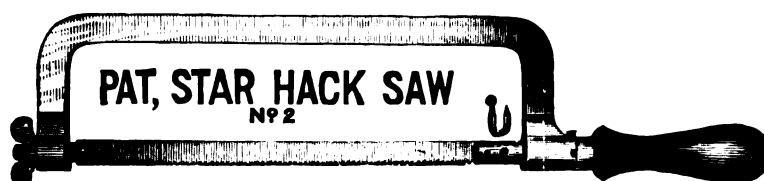
Each \$3 00

BREAST DRILL.

No. 13.

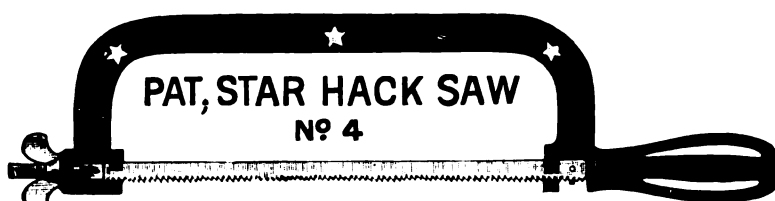
**Plate 698.**

Each \$4 00

HACK SAW FRAMES.**Plate 699.**

No. 2 Solid Frame, to hold 8 inch, Steel Polished and Nickel-plated, per doz . . . \$12 00

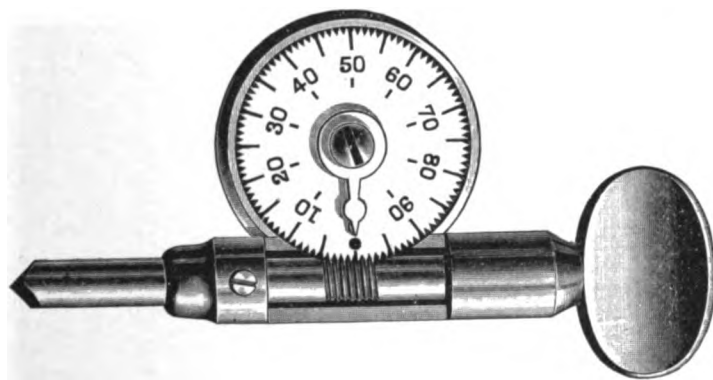
No. 4 is a patent cast-iron frame, carrying a 9 inch blade, and so constructed as to face it in four different directions. The pins which hold the blade are fast in the frame, and cannot drop out. It is very stiff and desirable frame, with Japan finish.
Per doz. \$7 20

**Plate 700.****STAR HACK SAW BLADES.**

Length of Blade	6	7	8	9	10	11	12 in.
Per doz.	\$0 75	90	1 00	1 10	1 20	1 35	1 50

EUREKA HACK SAW BLADES.

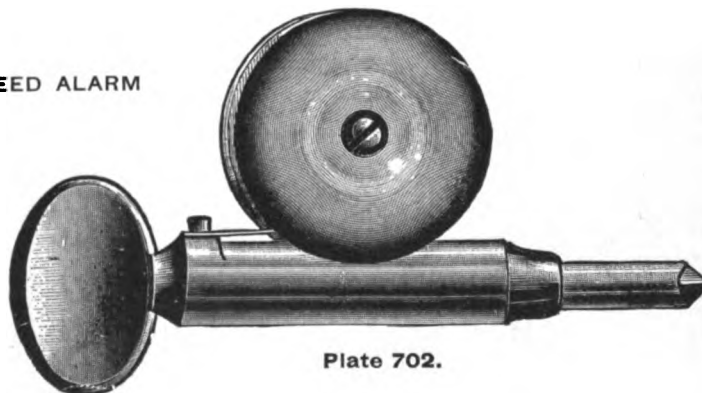
Length of Blade	6	7	8	9	10	11	12 in.
Per doz.	\$0 55	60	65	70	75	85	90

SPEED INDICATORS.**Plate 701.****SINGLE SPEED INDICATOR.**

Single Speed Indicator, each, \$0 75

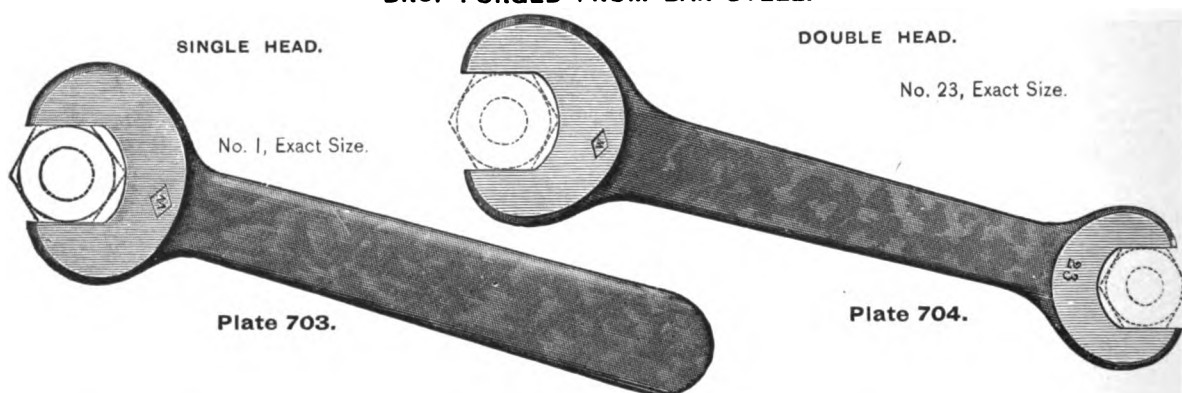
THE WEISS DOUBLE SPEED ALARM INDICATOR.

Price, each \$1 50

**Plate 702.**

ENGINEERS' WRENCHES.

DROP-FORGED FROM BAR STEEL.



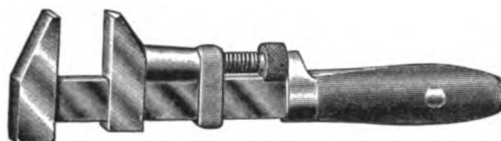
These Wrenches are particularly adapted for Machine Tools, Locomotives, Pumps, Steam or Gas Engines, and general shop use. The opening forms an angle of 15 degrees with the handle, which admits of turning a hexagon nut completely around where the swing of the handle is limited to 30 degrees. The finished Wrenches are polished, case hardened and milled to fit U. S. Standard Nuts, but can be milled to other sizes when required.

SINGLE HEAD.

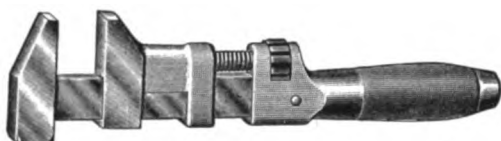
No.	Size Bolt, U. S. Standard Nut	Opening Unfinished	Opening Finished	Extreme Length	Thickness Head	Price Unfinished	Price Finished	No.	Size Bolt, U. S. Standard Nut	Opening Unfinished	Opening Finished	Extreme Length	Thickness Head	Price Unfinished	Price Finished
0	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	27 $\frac{1}{8}$	$\frac{1}{4}$	\$0 09	18	10	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	14 $\frac{1}{8}$	$\frac{3}{8}$	\$0 65	1 30
1	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	33 $\frac{1}{4}$	$\frac{1}{4}$	10	20	11	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	16 $\frac{1}{8}$	$\frac{3}{8}$	85	1 70
2	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	43 $\frac{1}{4}$	$\frac{3}{8}$	12	24	12	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	18 $\frac{1}{4}$	$\frac{1}{2}$	1 10	2 20
3	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	53 $\frac{1}{4}$	$\frac{1}{2}$	14	28	13	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	20 $\frac{3}{8}$	$\frac{1}{2}$	1 40	2 80
4	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	63 $\frac{1}{4}$	$\frac{5}{8}$	17	34	14	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	22 $\frac{1}{2}$	$\frac{1}{2}$	1 75	3 50
5	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	73 $\frac{1}{4}$	$\frac{3}{4}$	20	40	15	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	24	$\frac{1}{2}$	2 10	4 20
6	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	83 $\frac{1}{4}$	$\frac{7}{8}$	25	50	16	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	25 $\frac{1}{2}$	$\frac{1}{2}$	2 50	5 00
7	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	91 $\frac{1}{4}$	$\frac{1}{2}$	32	64	17	2	$\frac{3}{4}$	$\frac{3}{4}$	29 $\frac{1}{2}$	$\frac{1}{2}$	3 50	7 00
8	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	111 $\frac{1}{4}$	$\frac{3}{4}$	40	80	18	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	33	$\frac{1}{2}$	4 75	9 50
9	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	13	$\frac{7}{8}$	50	1 00								

DOUBLE HEAD.

No.	Size Bolts, U. S. Standard Nuts.	Openings Unfinished	Openings Finished	Extreme Length	Thickness Heads	Price Unfinished	Price Finished
21	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	31 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	\$0 12	24
22	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	4	$\frac{1}{4}$ and $\frac{1}{4}$	14	28
23	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	4	$\frac{1}{4}$ and $\frac{1}{4}$	15	30
24	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	47 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	17	34
25	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	47 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	18	36
26	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	57 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	20	40
27	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	57 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	21	42
28	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	67 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	23	46
29	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	67 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	25	50
30	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	73 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	28	56
31	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	73 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	30	60
32	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	83 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	34	68
33	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	83 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	36	72
34	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	93 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	41	82
35	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	93 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	43	86
36	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	113 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	50	1 00
37	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	113 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	53	1 06
38	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	133 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	62	1 24
39	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	133 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	65	1 30
40	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	153 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	78	1 56
41	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	153 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	82	1 64
42	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	173 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	1 00	2 00
43	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	173 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	1 08	2 16
44	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	193 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	1 27	2 54
45	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	193 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	1 35	2 70
46	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	211 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	1 65	3 30
47	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	211 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	1 75	3 50
48	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	231 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	2 10	4 20
49	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	231 $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	2 25	4 50
50	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	251 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	2 65	5 30
51	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	251 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	2 85	5 70
52	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	271 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	3 30	6 60
53	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	271 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	3 55	7 10
54	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	307 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	4 15	8 30
55	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	307 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	4 55	9 10
56	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	345 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	5 35	10 70
57	$\frac{1}{8}$ and $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	$\frac{1}{4}$ and $\frac{1}{4}$	345 $\frac{1}{8}$	$\frac{1}{4}$ and $\frac{1}{4}$	5 95	11 90

COE'S WRENCHES.**Plate 705.**

Size	6	8	10	12	15	18	21 in.
Black, per doz	\$ 9 00	10 00	12 00	14 00	24 00	30 00	36 00
Bright, per doz	10 00	11 00	14 00	16 00	26 00	32 00	38 00

ENGINEERS' WRENCHES.**Plate 706.**

Size	6	8	10	12	15	18	21 in.
Black, per doz	\$ 9 00	10 00	12 00	14 00	24 00	30 00	36 00
Bright, per doz	10 00	11 00	14 00	16 00	26 00	32 00	38 00

BAXTER "S" WRENCHES.**Plate 707.**

Size	4	6	8	10	12	15 in.
Each	\$0 50	75	1 00	1 50	2 00	2 50

PRENTISS' PATENT VISES.

**MACHINISTS AND IRON-WORKERS
GENERALLY.**

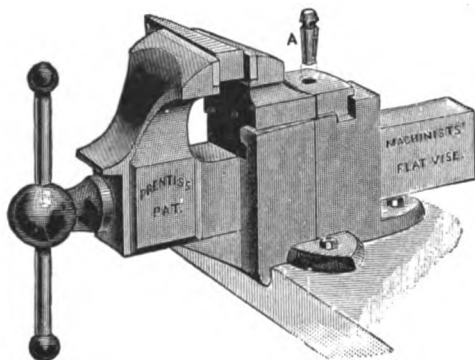


Plate 708.

**PRENTISS' PATENT SELF-ADJUSTING JAW,
MACHINISTS' STATIONARY BOTTOM VISE.**

No. 1, Stationary Bottom	Weight 13½ lbs.	\$5 50
2½ in. Jaws. Opens 3½ in.		
No. 2, Stationary Bottom	Weight 28 lbs.	\$7 00
3½ in. Jaws. Opens 4¾ in.		
No. 2½, Stationary Bottom	Weight 41 lbs.	\$9 00
4 in. Jaws. Opens 5¼ in.		
No. 3, Stationary Bottom	Weight 54 lbs.	\$10 50
4½ in. Jaws. Opens 6 in.		
No. 4, Stationary Bottom	Weight 98 lbs.	\$17 00
5¼ in. Jaws. Opens 8 in.		
No. 5, Stationary Bottom	Weight 146 lbs.	\$24 00
6 in. Jaws. Opens 9 in.		
No. 6, Stationary Bottom	Weight 184 lbs.	\$30 00
7 in. Jaws. Opens 11 in.		

**FOR RAILROAD SHOPS,
MACHINISTS, MANUFACTURERS,
MECHANICS, ETC.**

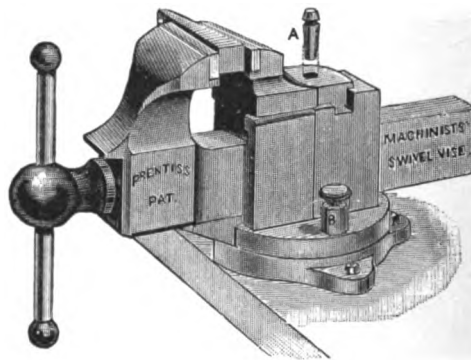


Plate 709.

**PRENTISS' PATENT SELF-ADJUSTING JAW,
MACHINISTS' SWIVEL BOTTOM VISE.**

No. 18, Patent Swivel Bottom	Weight 17 lbs.	\$6 75
2½ in. Jaws. Opens 3½ in.		
No. 19, Patent Swivel Bottom	Weight 32 lbs.	\$8 50
3½ in. Jaws. Opens 4¾ in.		
No. 19½, Patent Swivel Bottom	Weight 46 lbs.	\$10 50
4 in. Jaws. Opens 5¼ in.		
No. 20, Patent Swivel Bottom	Weight 65 lbs.	\$12 50
4½ in. Jaws. Opens 6 in.		
No. 21, Patent Swivel Bottom	Weight 109 lbs.	\$19 00
5¼ in. Jaws. Opens 8 in.		
No. 22, Patent Swivel Bottom	Weight 168 lbs.	\$27 00
6 in. Jaws. Opens 9 in.		
No. 23, Patent Swivel Bottom	Weight 207 lbs.	\$35 00
7 in. Jaws. Opens 11 in.		

PRENTISS' PATENT WOOD WORKERS' VISES.

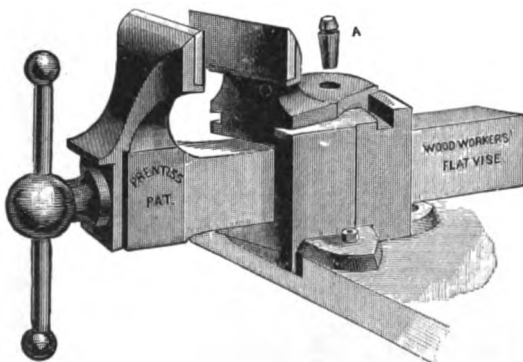


Plate 710.

Our Coach Makers' Vises, which are constructed upon the same principles as the Iron Workers' before described, are acknowledged to possess many advantages over any others yet offered for car and carriage builders, furniture manufacturers, pattern makers, and all wood workers generally.

**PRENTISS' PATENT SELF-ADJUSTING JAW,
COACH MAKERS' STATIONARY BOTTOM VISE.**

No. 12, Stationary Bottom	Weight 30 lbs.	\$8 00
3½ in. Jaws. Opens 7 in.		
No. 10, Stationary Bottom	Weight 59 lbs.	\$11 00
4½ in. Jaws. Opens 9½ in.		

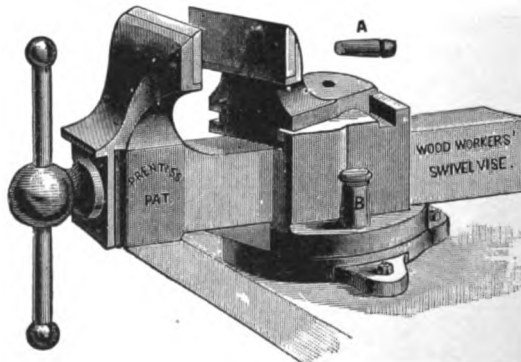


Plate 711.

Our Self-Adjusting Jaw, Coach Makers' Vise, combined with the Patent Swivel Bottom, makes the best vise ever offered artisans in wood, the large surfaces of the jaws, (which are finished smooth) protecting the work from injury, while the Self-Adjusting Jaw easily and firmly holds articles of any shape.

**PRENTISS' PATENT SELF-ADJUSTING JAW
COACH MAKERS' PATENT SWIVEL BOTTOM VISE.**

No. 27, Patent Swivel Bottom	Weight 34 lbs.	\$9 50
3½ in. Jaws. Opens 7 in.		
No. 26, Patent Swivel Bottom	Weight 67 lbs.	\$13 00
4½ in. Jaws. Opens 9½ in.		

LEWIS' PATENT VISES FOR MACHINISTS AND IRON WORKERS GENERALLY.

LEWIS' PATENT SELF-ADJUSTING JAW MACHINISTS' STATIONARY BOTTOM VISES.

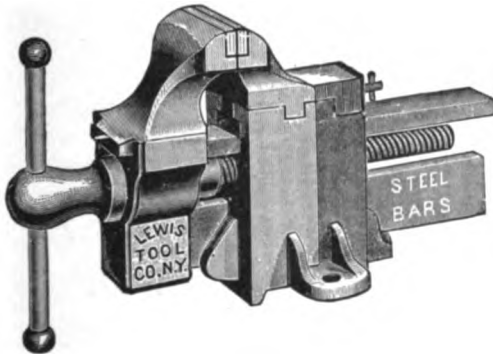


Plate 712.

No.	Width Jaw	Opens	Weight	List Price
3	2½ in.	3½ in.	18 lbs.	\$ 5 50
5	3 in.	4 in.	25 lbs.	6 25
7	3½ in.	5 in.	33 lbs.	7 00
9	4 in.	6 in.	54 lbs.	9 00
11	4½ in.	7 in.	70 lbs.	10 50
13	5 in.	8 in.	105 lbs.	16 00
15	5½ in.	9 in.	125 lbs.	18 00
17	6½ in.	10 in.	165 lbs.	24 00
19	7½ in.	12 in.	198 lbs.	30 00

In ordering, use Catalogue numbers. No other description is necessary.

LEWIS' PATENT VISES FOR RAIL- ROAD SHOPS, MACHINISTS, AND ALL IRON MANU- FACTURERS.

LEWIS' PATENT SELF-ADJUSTING JAW MACHINISTS' SWIVEL BOTTOM VISES.

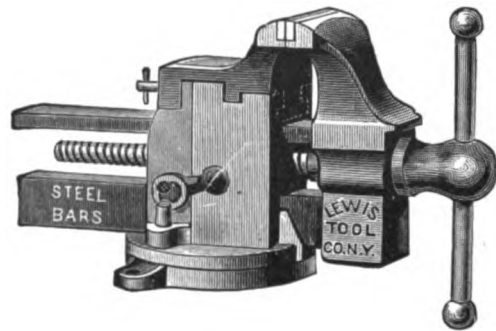


Plate 713.

No.	Width Jaw	Opens	Weight	List Price
4	2½ in.	4½ in.	22 lbs.	\$ 6 75
6	3 in.	4 in.	29 lbs.	7 50
8	3½ in.	5 in.	38 lbs.	8 50
10	4 in.	6 in.	60 lbs.	10 50
12	4½ in.	7 in.	78 lbs.	12 50
14	5 in.	8 in.	120 lbs.	18 00
16	5½ in.	9 in.	142 lbs.	21 00
18	6½ in.	10 in.	185 lbs.	27 00
20	7½ in.	12 in.	222 lbs.	35 00

In ordering, use Catalogue numbers. No other description is necessary.

LEWIS' PATENT SELF-ADJUSTING JAW WOOD WORKERS' VISE.

STATIONARY BOTTOM.

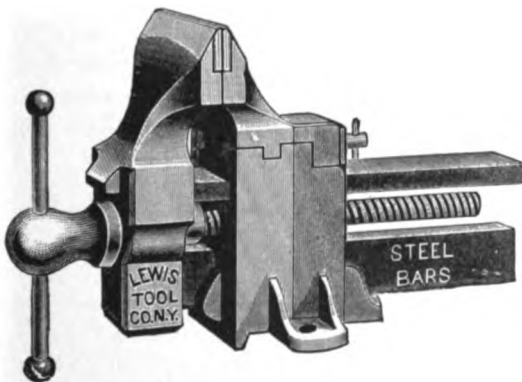


Plate 714.

No.	Width Jaw	Opening	Weight	List Price
25	4¼ in.	9 in.	57 lbs.	\$9 50

In ordering, use Catalogue numbers. No other description is necessary.

LEWIS' PATENT ADJUSTABLE JAW WOOD WORKERS' VISE.

PATENT SWIVEL BOTTOM.

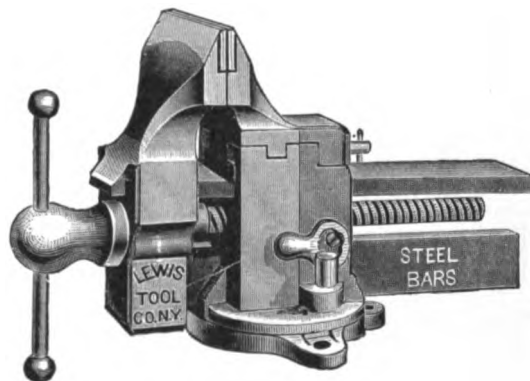


Plate 715.

No.	Width Jaw	Opening	Weight	List Price
26	4¼ in.	9 in.	62 lbs.	\$11 00

In ordering, use Catalogue numbers. No other description is necessary.

PARKER'S PATENT PARALLEL VISE.

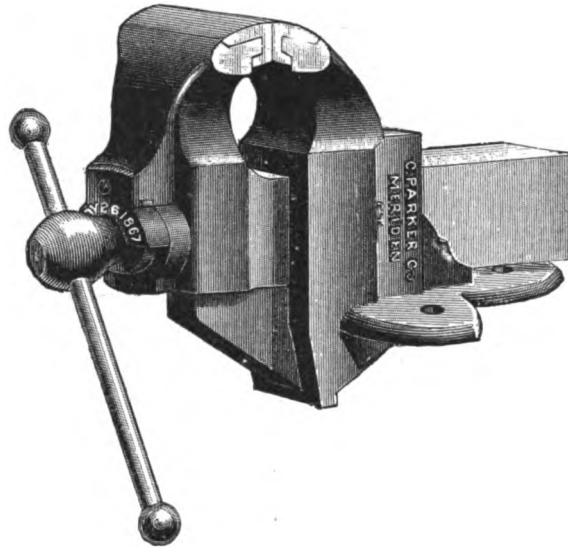


Plate 716.

No. 000, Round Jaws, weight 23 lbs., length of Jaws $3\frac{1}{4}$ inches, each	\$ 6 25
No. 1, Round Jaws, weight $31\frac{1}{2}$ lbs., length of Jaws $3\frac{3}{8}$ inches, each	7 00
No. 2, Round Jaws, weight $41\frac{1}{2}$ lbs., length of Jaws $4\frac{1}{8}$ inches, each	9 00
No. 3, Round Jaws, weight $59\frac{1}{2}$ lbs., length of Jaws $4\frac{3}{4}$ inches, each	11 75
No. 4, Round Jaws, weight 83 lbs., length of Jaws $5\frac{3}{8}$ inches, each	16 25
No. 5, Round Jaws, weight 120 lbs., length of Jaws $6\frac{1}{8}$ inches, each	24 00
No. 6, Round Jaws, weight 237 lbs., length of Jaws $8\frac{1}{8}$ inches, each	50 00

PARKER'S PATENT PARALLEL SWIVEL VISE.

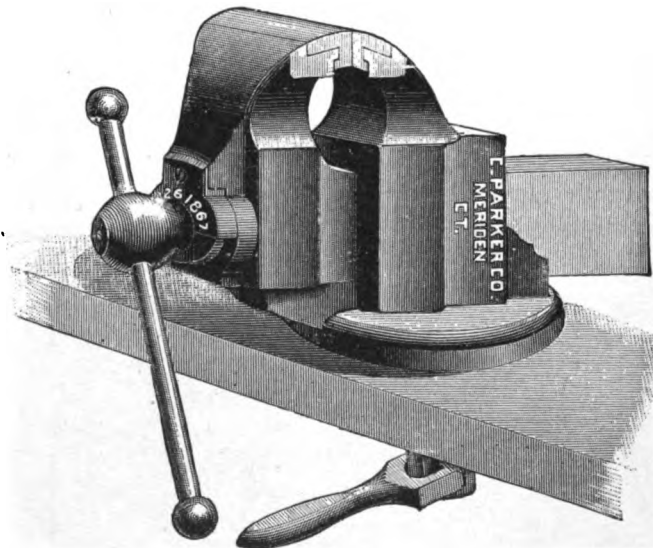
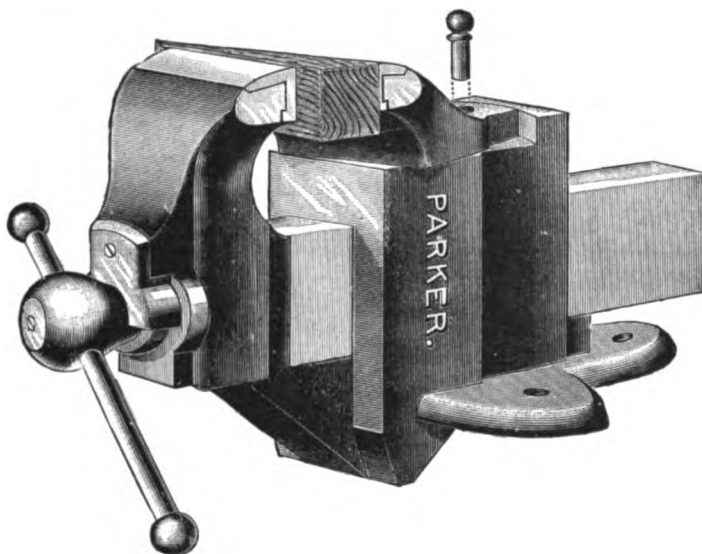


Plate 717.

These Swivel Vises do not have Parker's Patent Cast Steel Anvil.

No. 23, Round Jaws, Swivel, weight 48 lbs., length of Jaws $4\frac{1}{8}$ inches, each	\$11 00
No. 24, Round Jaws, Swivel, weight $63\frac{1}{2}$ lbs., length of Jaws $4\frac{3}{4}$ inches, each	14 50
No. 25, Round Jaws, Swivel, weight 90 lbs., length of Jaws $5\frac{3}{8}$ inches, each	20 50
No. 26, Round Jaws, Swivel, weight 131 lbs., length of Jaws $6\frac{1}{8}$ inches, each	30 00

The steel faces of these Vises are milled and fitted to the jaws, and are renewable at a trifling cost.

PARKER'S PATENT PARALLEL VICTOR VISES.**Plate 718.**

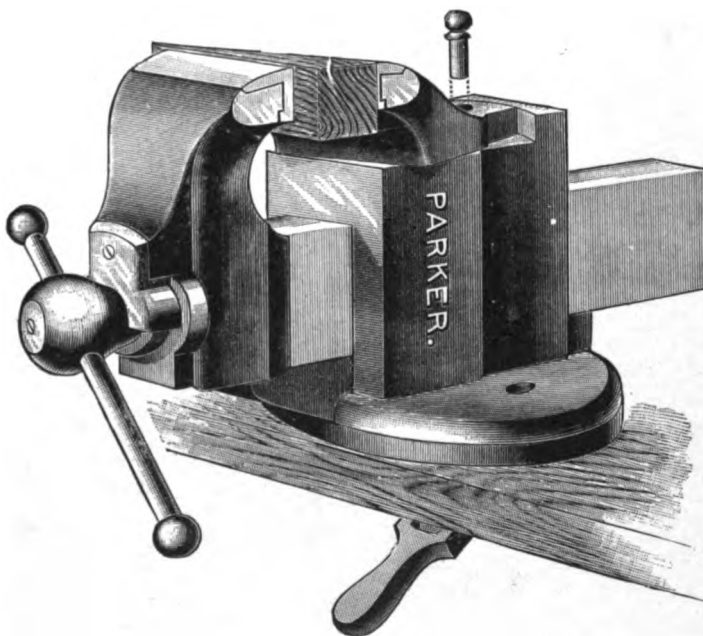
These vises have self-adjusting back jaws, which automatically adapt themselves for holding wedge-shaped pieces. The steel faces of these vises are milled and fitted to the jaws, and are renewable at a trifling cost.

No. 370.	Length of Jaws, 3¼ inches;	Weight, 25 lbs., each	.....	\$ 6 50
No. 371.	Length of Jaws, 3⅝ inches;	Weight, 39 lbs., each	.....	7 00
No. 372.	Length of Jaws, 4½ inches;	Weight, 57 lbs., each	.....	10 00
No. 373.	Length of Jaws, 5 inches;	Weight, 73 lbs., each	.....	14 00
No. 374.	Length of Jaws, 5½ inches;	Weight, 98 lbs., each	.....	17 00
No. 375.	Length of Jaws, 6¼ inches;	Weight, 150 lbs., each	.....	24 00

**PARKER'S PATENT
SWIVEL
VICTOR VISES**

These Vises have self-adjusting back jaws, which automatically adapt themselves for holding wedge-shaped pieces.

The steel faces of these vises are milled and fitted to the jaws, and are renewable at a trifling cost.

**Plate 719.**

No. 270.	Length of Jaws, 3¼ inches;	Weight, 30 lbs., each	.....	\$ 7 00
No. 271.	Length of Jaws, 3⅝ inches;	Weight, 42 lbs., each	.....	8 50
No. 272.	Length of Jaws, 4½ inches;	Weight, 60 lbs., each	.....	12 50
No. 273.	Length of Jaws, 5 inches;	Weight, 78 lbs., each	.....	18 00
No. 274.	Length of Jaws, 5½ inches;	Weight, 110 lbs., each	.....	19 00
No. 275.	Length of Jaws, 6¼ inches;	Weight, 165 lbs., each	.....	27 00

BULL DOG, SOLID JAW, PARALLEL VISES.

Our new and improved pattern Solid Jaw Parallel Machinists', Blacksmiths', and Wood-Workers' Bench Vises are placed in market under the trade name "Bull Dog," adopted by us to distinguish our vises from other similar goods.

The Bull Dog Vises are not only of best pattern, best materials, best workmanship and finish, but also are sold at lower prices than any other first-class vise of this kind.

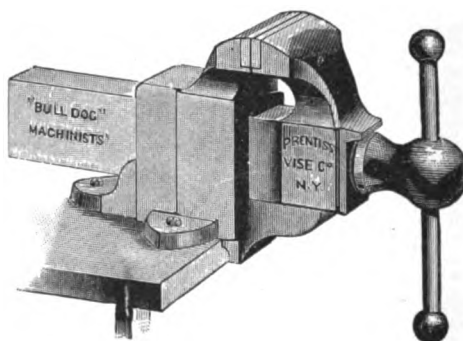


Plate 720.

MACHINISTS' SOLID JAW PARALLEL VISE.

No. 50, Flat Bottom, $3\frac{1}{4}$ inch Jaws, opens 4 inches	\$ 6 00
No. 51, Flat Bottom, $3\frac{5}{8}$ inch Jaws, opens 5 inches	7 00
No. 52, Flat Bottom, $4\frac{1}{8}$ inch Jaws, opens $5\frac{1}{2}$ inches	8 50
No. 53, Flat Bottom, $4\frac{5}{8}$ inch Jaws, opens $6\frac{1}{4}$ inches	10 00
No. 54, Flat Bottom, 5 inch Jaws, opens 7 inches	13 00
No. 56, Flat Bottom, 6 inch Jaws, opens 9 inches	25 00

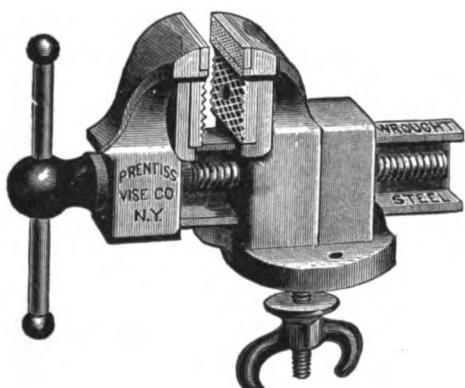


Plate 721.

PRENTISS' IMPROVED COMBINATION PIPE VISES.

Our Pipe Vise, as first constructed, has been in constant use during the last five years in the largest pipe establishments requiring such tools, and has given unqualified satisfaction. We now offer it with our latest improvement, "The Wrought Steel (Channel) Sliding Bar," which makes it unbreakable and superior to all others.

The Grip Plates are made of best steel, carefully tempered, and are deeply serrated at right angles, forming innumerable points.

These heavy Steel Plate Pipe Jaws are reversible and interchangeable, and are full width of vise, thereby giving greater holding contact, with much less pressure on the pipe than with old style concave jaws.

Pipe may be held at various angles and a slight turn of lever releases it. Capacity greater than other vises.

No. 81, Jaws $3\frac{1}{2}$ inches; holds $\frac{1}{8}$ to $2\frac{1}{2}$ inch pipe; weight 35 pounds	\$16 00
No. 82, Jaws $4\frac{1}{2}$ inches; holds $\frac{1}{4}$ to 4 inch pipe; weight 55 pounds	20 00
No. 83, Jaws 5 inches; holds $\frac{1}{2}$ to 6 inch pipe; weight 100 pounds	30 00

THE AUSTIN COMBINATION VISE.

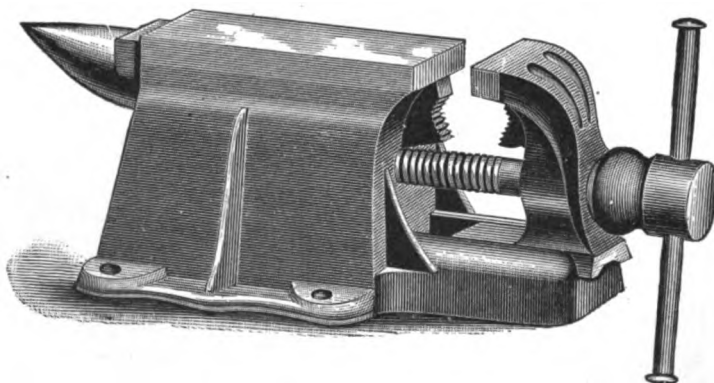


Plate 722.

No. 1, weight 10 pounds, 2 inch Jaw, opens 3 inches	\$3 00
No. 2, weight 20 pounds	4 00
No. 3, weight 30 pounds, 3 inch Jaw, opens 5 inches	5 00

SOLID BOX VISES.

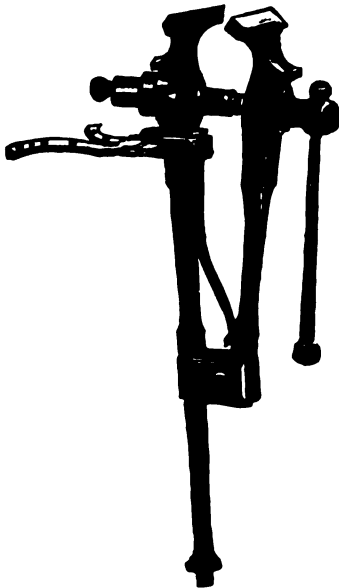


Plate 723.

No.	35,	weighing about	35 pounds,	each	\$10 00
"	40,	"	40 "	" " " " " "	10 50
"	45,	"	45 "	" " " " " "	11 00
"	50,	"	50 "	" " " " " "	11 50
"	55,	"	55 "	" " " " " "	12 00
"	60,	"	60 "	" " " " " "	13 00
"	65,	"	65 "	" " " " " "	14 00
"	70,	"	70 "	" " " " " "	15 00
"	75,	"	75 "	" " " " " "	16 00
"	80,	"	80 "	" " " " " "	17 50
"	85,	"	85 "	" " " " " "	18 50
"	90,	"	90 "	" " " " " "	20 00
"	95,	"	95 "	" " " " " "	21 00
"	100,	"	100 "	" " " " " "	22 00
"	105,	"	105 "	" " " " " "	23 00
"	110,	"	110 "	" " " " " "	24 00
"	115,	"	115 "	" " " " " "	25 00
"	120,	"	120 "	" " " " " "	26 00
"	125,	"	125 "	" " " " " "	27 50
"	130,	"	130 "	" " " " " "	29 00
"	135,	"	135 "	" " " " " "	31 50
"	140,	"	140 "	" " " " " "	33 00
"	145,	"	145 "	" " " " " "	35 00
"	150,	"	150 "	" " " " " "	36 00
"	160,	"	160 "	" " " " " "	41 50
"	170,	"	170 "	" " " " " "	44 50
"	180,	"	180 "	" " " " " "	47 00
"	190,	"	190 "	" " " " " "	53 00
"	200,	"	200 "	" " " " " "	56 00

BOXES AND SCREWS.

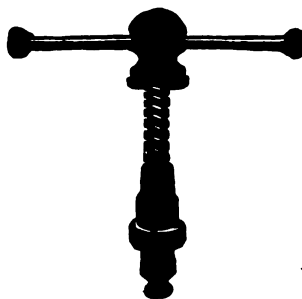
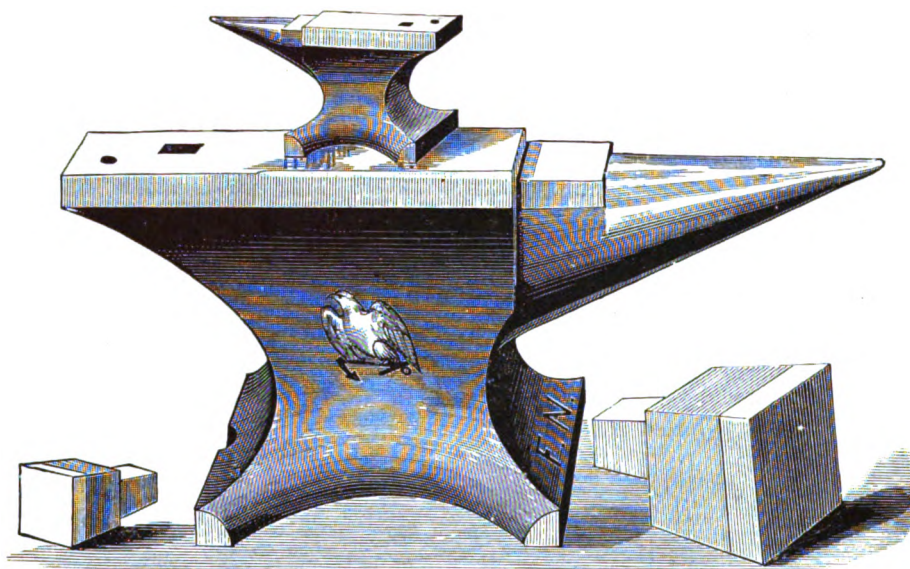


Plate 724.

No. 1, for Visers from	30 to 40 pounds, each	\$3 50
" 2, " "	40 to 60 " "	4 00
" 3, " "	60 to 85 " "	4 50
" 4, " "	90 to 130 " "	6 50
" 5, " "	130 to 200 " "	8 00

EAGLE ANVILS.**Plate 725.**

Anvils weighing 100 to 800 lbs 9 cents per lb.

SMALLER ANVILS—"MINIMS."

No	000	00	0	1	2	3	4	5	6	7	8	9
Weighing about	$\frac{1}{2}$ lb.	4 lb.	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
Each	\$1.00	1.75	2.25	2.75	3.00	3.75	4.25	5.00	5.50	6.00	7.00	8.00

MANDRILS.**Plate 726.**

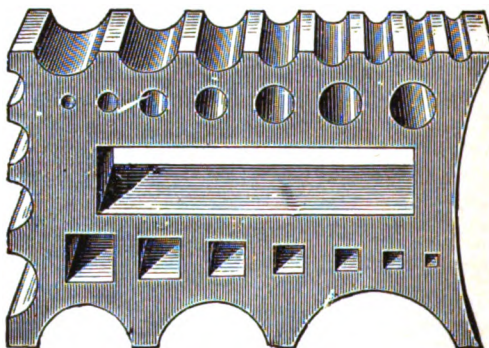
Taper per foot, $2\frac{1}{2}$ inches.

Size, 10 in. at base; length, 3 feet 6 inches.

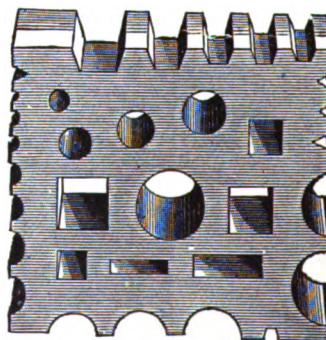
Per lb

Size, 14 in. at base; length, 4 feet 6 inches.

Per lb

SWAGE BLOCKS.**Plate 727.**

No. 1. Size, $19\frac{1}{2} \times 13\frac{1}{2} \times 4$ inches; weight about 150 lbs.
Per lb

**Plate 728.**

No. 2. Size, $15 \times 15 \times 4$ inches; weight about 150 lbs.
Per lb

SOLID CAST STEEL RIVETING HAMMER.

PLAIN EYE.

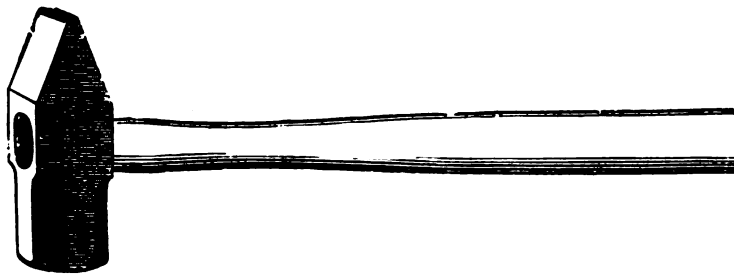
**Plate 729.**

Number	0	1	2	3	4	5	6	7
Weight	4 oz.	7 oz.	9 oz.	12 oz.	15 oz.	1 lb. 5 oz.	1 lb. 6 oz.	1 lb. 10 oz.
Per dozen	\$5 50	5 75	6 00	6 25	6 50	7 00	7 50	8 00

Above weights include handles.

SOLID CAST STEEL ENGINEERS' HAMMER.

SINGLE FACE.

**Plate 730.**

Number	0	1	2	3	4	5	6
Weight	1 lb. 2 oz.	1 lb. 10 oz.	2 lb.	2 lb. 10 oz.	3 lb.	3 lb. 8 oz.	4 lb. 8 oz.
Per dozen	\$12 00	13 00	14 00	15 00	16 00	17 00	19 00

Above weights include handles.

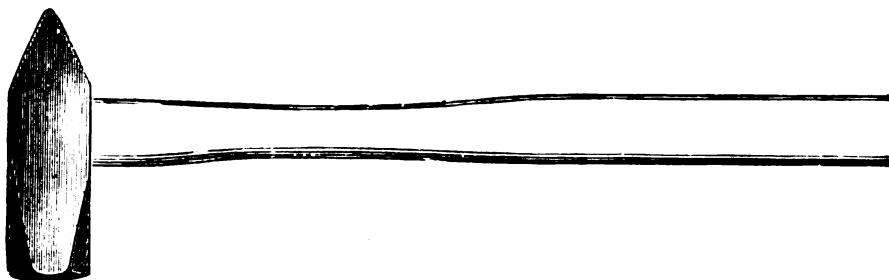
SOLID CAST STEEL ENGINEERS' HAMMER.

DOUBLE FACE.

**Plate 731.**

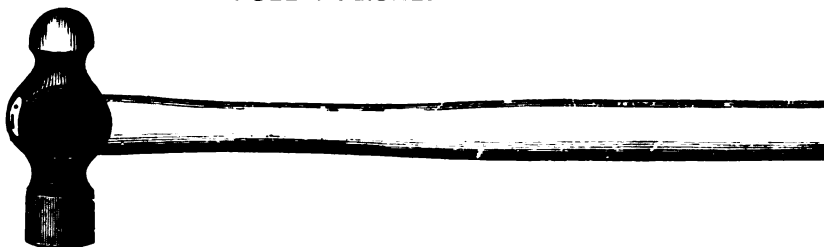
Number	0	1	2	3	4
Weight	1 lb. 8 oz.	2 lb.	2 lb. 6 oz.	3 lb.	3 lb. 10 oz.
Per dozen	\$14 50	15 50	16 50	18 00	19 50

Above weights include handles.

SOLID CAST STEEL BLACKSMITHS' HAND HAMMER.**Plate 732.**

Number	0	1	2	3	4	5
Weight	1 lb. 10 oz.	2 lb.	2 lb. 10 oz	3 lb.	3 lb. 8 oz.	4 lb. 8 oz.
Per dozen	\$13 00	14 00	15 00	16 00	17 00	19 00

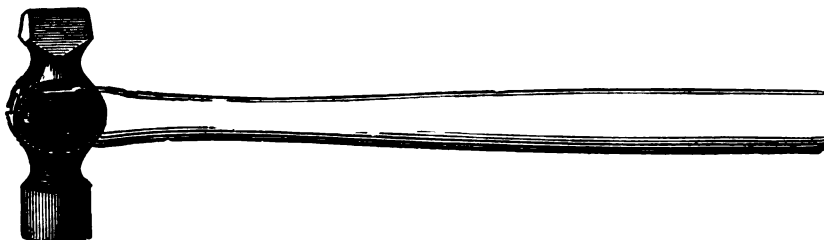
Above weights include handles.

SOLID CAST STEEL MACHINISTS' HAMMER.**FULL POLISHED BALL PEIN.****Plate 733.**

Number	00	0	1	2
Weight	8 oz.	12 oz.	1 lb. 8 oz.	2 lb.
Per dozen	\$15 00	15 00	17 50	19 50

Number	3	4	5	6
Weight	2 lb. 4 oz.	2 lb. 8 oz.	3 lb.	3 lb. 8 oz.
Per dozen	\$20 50	22 00	25 00	27 00

Above weights include handles.

SOLID CAST STEEL MACHINISTS' HAMMER.**STRAIGHT AND CROSS PEIN.****Plate 734.**

Number	00	0	1	2	3	4	5	6
Weight	8 oz.	12 oz.	1 lb. 8 oz.	2 lb.	2 lb. 4 oz.	2 lb. 8 oz.	3 lb.	3 lb. 8 oz.
Per dozen	\$15 00	15 00	17 50	19 50	20 50	22 00	25 00	27 00

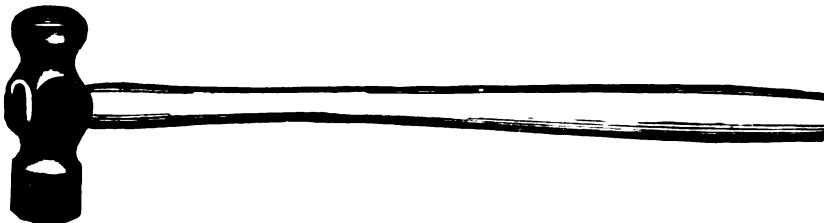
Above weights include handles.

SOLID CAST STEEL MACHINISTS' HAMMER.**Plate 735.****OCTAGON PATTERN—BALL PEIN, STRAIGHT AND CROSS PEIN.**

Number	0000	000	00	0	1	2
Weight	6 oz.	8 oz.	12 oz.	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.
Per dozen	\$12 00	12 00	12 00	12 50	13 50	14 50

Number	3	4	5	6	7	8	9
Weight	1 lb. 12 oz.	2 lb.	2 lb. 4 oz.	2 lb. 8 oz.	2 lb. 12 oz.	3 lb.	3 lb. 8 oz.
Per dozen	\$15 50	16 50	17 50	19 00	20 50	22 00	24 00

Above weights include handles.

SOLID CAST STEEL CARRIAGE IRONERS' HAND HAMMER.**Plate 736.**

Number	1	2	3
Weight	1 lb. 14 oz.	2 lb. 6 oz.	2 lb. 12 oz.
Per dozen	\$15 50	16 50	17 50

Above weights include handles.

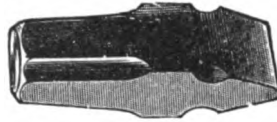
SOLID CAST STEEL CHIPPING HAMMER.**Plate 737.**

Number	0	1	2	3	4	5
Weight	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.	2 lb.	2 lb. 8 oz.	2 lb. 14 oz.
Per dozen	\$12 50	13 00	13 50	14 50	15 50	16 50

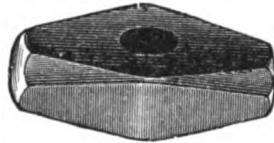
Above weights include handles.

SOLID CAST STEEL HAMMERS.

BLACK, POLISHED FACE.

**Plate 738.**

Smith's Hand, solid steel, 5 to 16 lbs.	per lb., \$0 30
Smith's Hand, solid steel, 3 to 5 lbs.	per lb., 36
Smith's Hand, solid steel, under 3 lbs	per lb., 45

**Plate 739.**

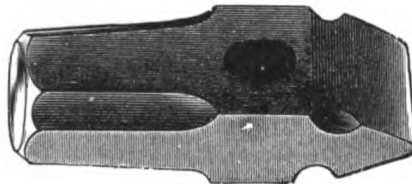
Napping, solid steel, 5 to 16 lbs	per lb., \$0 36
Napping, solid steel, 3 to 5 lbs	per lb., 36
Napping, solid steel, under 3 lbs	per lb., 45

**Plate 740.**

Hand Drilling Hammers, solid steel, 5 lbs. and above	per lb., \$0 36
Hand Drilling Hammers, solid steel, 3 to 5 lbs	per lb., 44
Hand Drilling Hammers, solid steel, under 3 lbs	per lb., 50

**Plate 741.**

Striking Sledges, solid steel, 5 to 16 lbs.	per lb., \$0 30
Striking Sledges, solid steel, 3 to 5 lbs.	per lb., 36

**Plate 742.**

Smith Sledges, solid steel, 5 to 16 lbs.	per lb., \$0 30
Smith Sledges, solid steel, 3 to 5 lbs.	per lb., 36

STEEL CROWBARS.**Plate 743.**

All weights. Per lb	\$0 15
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SOLID CAST STEEL FLATTER.

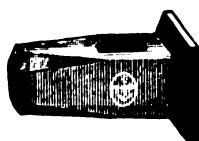


Plate 744.

2 to 4 inch, by quarters. per pound, \$0 50

SOLID CAST STEEL TOP SWEDGE.



Plate 745.

$\frac{1}{4}$ to 2 inch, by eighths. per pound, \$0 55

SOLID CAST STEEL BOTTOM SWEDGE.



Plate 746.

$\frac{1}{4}$ to 2 inch, by eighths. per pound, \$0 55

SOLID CAST STEEL TOP FULLER.

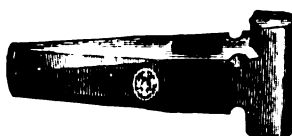


Plate 747.

$\frac{1}{4}$ to 2 inch, by eighths. per pound, \$0 55

SOLID CAST STEEL BOTTOM FULLER.

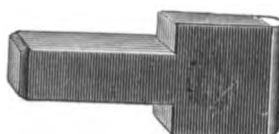


Plate 748.

$\frac{1}{4}$ to 2 inch, by eighths. per pound, \$0 55

SOLID CAST STEEL HARDIE.

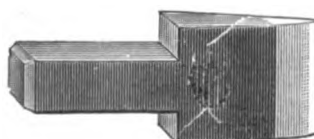


Plate 749.

$\frac{7}{8}$, 1 and $1\frac{1}{8}$ inch shanks. per pound, \$0 55

HOT AND COLD CHISELS.**COLD CUTTING.****Plate 750.**

Per lb. \$0 42

HOT CUTTING.**Plate 751.**

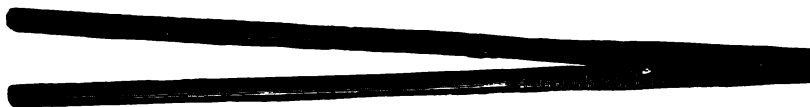
Per lb. \$0 42

COLD.**Plate 752.**

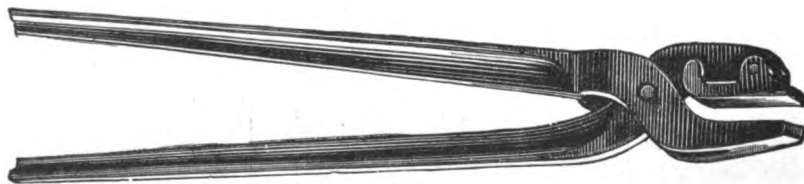
Size	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$ in.
Per doz.	\$3 00	3 50	4 00	4 50

HEADING TOOL.**Plate 753.**

Per lb. \$0 45

TONGS AND PINCERS.**BLACKSMITHS' TONGS.****Plate 754.**

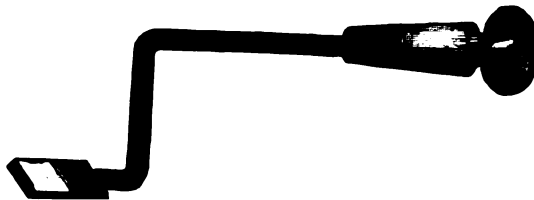
Size	16	18	20	22	24	26	28	30 in.
Per doz.	\$4 80	4 80	5 40	5 40	6 00	6 00	8 00	10 00

STEARNS' PATENT SWIVEL JAW BLACKSMITH TONGS.**FOR HOLDING IRREGULAR AND TAPERED PIECES OF IRON.****Plate 755.**

No. 1, 16-inch	per doz., \$10 00
No. 2, 18-inch	per doz., 10 00

FARRIERS' TOOLS.**FARRIERS' TURNING HAMMER.****Plate 756.**

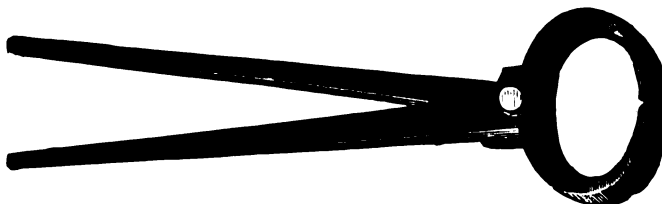
Full Polished, weight 2 to 3 lbs., per doz \$32 00
 Half Polished, weight 2 to 3 lbs., per doz 30 00

FARRIERS' BUTTRESS.**Plate 757.**

Per doz. \$ 6 50

FARRIERS' KNIFE.**Plate 758.**

IXL, per doz. \$ 6 00
 Wilkinson, per doz. 5 00

FARRIERS' PINCERS.**Plate 759.**

12 inch, per doz. \$7 50

BLACKSMITHS' STOCKS AND DIES.

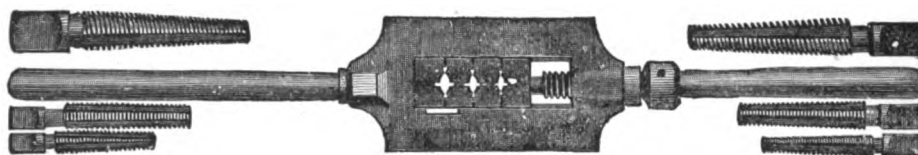
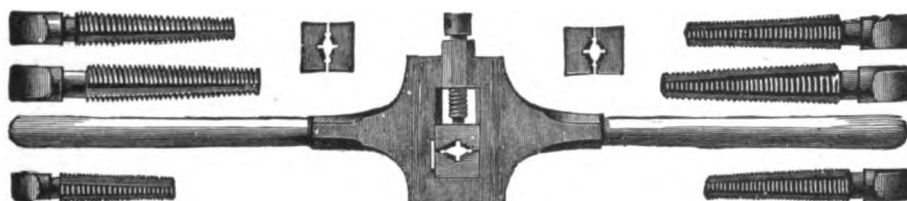
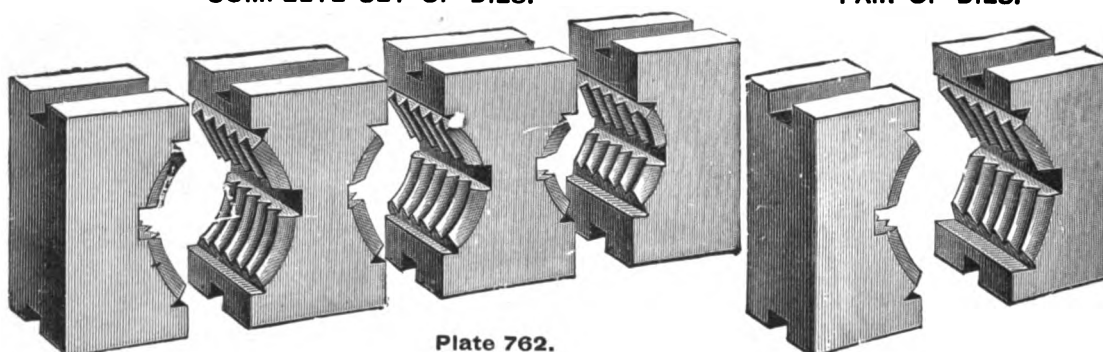


Plate 760.

No. 6 . . .	{ Cuts $1\frac{1}{2}$ inch to 1 inch, right hand, 8 threads to the inch Cuts $1\frac{1}{2}$ inch to 1 inch, left hand, 8 threads to the inch 4 Taps and 2 sets of Dies. }	each, \$20 00
No. 11 . . .	{ Cuts $1\frac{1}{4}$ inch to $\frac{5}{8}$ inch, right hand, 8 and 10 threads to the inch Cuts $1\frac{1}{4}$ inch to $\frac{5}{8}$ inch, left hand, 8 threads to the inch 4 Taps and 3 sets of Dies. }	each, 10 00
No. 15 . . .	{ Cuts $1\frac{1}{4}$ inch to $\frac{1}{2}$ inch, right hand, 8, 10 and 12 threads to the inch. 5 Taps and 3 sets of Dies. }	each, 10 00
No. 21 . . .	{ Cuts 1 inch to $\frac{1}{2}$ inch, right hand, 9 and 12 threads to the inch. Cuts 1 inch to $\frac{1}{2}$ inch, left hand, 9 threads to the inch 4 Taps and 3 sets of Dies. }	each, 6 00
No. 23 . . .	{ Cuts 1 inch to $\frac{3}{8}$ inch, right hand, 9, 10 and 14 threads to the inch. 3 Taps and 3 sets of dies. }	each, 5 00
No. 32 . . .	{ Cuts $\frac{3}{4}$ inch to $\frac{3}{8}$ inch, right hand, 10 and 14 threads to the inch Cuts $\frac{3}{4}$ inch to $\frac{3}{8}$ inch, left hand, 10 and 14 threads to the inch 4 Taps and 4 sets of Dies. }	each, 5 00
No. 33 . . .	{ Cuts $\frac{3}{4}$ inch to $\frac{1}{2}$ inch, right hand, 10 threads to the inch Cuts $\frac{3}{4}$ inch to $\frac{1}{2}$ inch, left hand, 10 threads to the inch 2 Taps and 2 sets of Dies. }	each, 4 00
No. 34 . . .	{ Cuts $\frac{3}{4}$ inch to $\frac{1}{4}$ inch, right hand, 10, 12 and 16 threads to the inch. 3 Taps and 3 sets of Dies. }	each, 4 50
No. 34A . .	{ Cuts $\frac{3}{4}$ inch to $\frac{1}{4}$ inch, right hand, 10, 12 and 14 threads to the inch. 3 Taps and 3 sets of Dies. }	each, 4 50
No. 34B . .	{ Cuts $\frac{3}{4}$ inch to $\frac{1}{4}$ inch, right hand, 12, 14 and 16 threads to the inch. 3 Taps and 3 sets of Dies. }	each, 4 50
No. 35 . . .	{ Cuts $\frac{3}{4}$ inch to $\frac{3}{8}$ inch, right hand, 10 and 14 threads to the inch 2 Taps and 2 sets of Dies. }	each, 4 00
No. 37 . . .	{ Cuts $\frac{5}{8}$ inch to $\frac{1}{4}$ inch, right hand, 14, 18 and 22 threads to the inch. 6 Taps and 3 sets of Dies. }	each, 4 25
No. 37A . .	{ Cuts $\frac{5}{8}$ inch to $\frac{1}{4}$ inch, right hand, 12, 14 and 16 threads to the inch. 6 Taps and 3 sets of Dies. }	each, 4 25
No. 37B . .	{ Cuts $\frac{5}{8}$ inch to $\frac{1}{4}$ inch, right hand, 14, 16 and 18 threads to the inch. 6 Taps and 3 sets of Dies. }	each, 4 25
No. 38 . . .	{ Cuts $\frac{5}{8}$ inch to $\frac{1}{4}$ inch, right hand, 12 and 18 threads to the inch Cuts $\frac{5}{8}$ inch to $\frac{1}{4}$ inch, left hand, 12 threads to the inch 6 Taps and 3 sets of Dies. }	each, 4 50
No. 41 . . .	{ Cuts $\frac{1}{2}$ inch to $\frac{1}{8}$ inch, right hand, 16, 20 and 26 threads to the inch. 6 Taps and 3 sets of Dies. }	each, 3 25
No. 41A . .	{ Cuts $\frac{1}{2}$ inch to $\frac{1}{8}$ inch, right hand, 14, 16 and 18 threads to the inch. 6 Taps and 3 sets of Dies. }	each, 3 25
No. 41B . .	{ Cuts $\frac{1}{2}$ inch to $\frac{1}{8}$ inch, right hand, 16, 18 and 20 threads to the inch. 6 Taps and 3 sets of Dies. }	each, 3 25
No. 42 . . .	{ Cuts $\frac{1}{2}$ inch to $\frac{1}{4}$ inch, right hand, 14 and 20 threads to the inch. Cuts $\frac{1}{2}$ inch to $\frac{1}{4}$ inch, left hand, 14 threads to the inch 6 Taps and 3 sets of Dies. }	each, 3 50
No. 43 . . .	{ Cuts $\frac{1}{2}$ inch to $\frac{1}{8}$ inch, right hand, 16, 20 and 26 threads to the inch. 4 Taps and 3 sets of Dies. }	each, 3 00
No. 53 . . .	{ Cuts $\frac{1}{4}$ inch to $\frac{1}{8}$ inch, right hand, 16, 20, 24 and 32 threads to the inch . . . 4 Taps and 4 sets of Dies }	each, 2 75
No. 55 . . .	{ Cuts $\frac{1}{4}$ inch to $\frac{1}{8}$ inch, right hand, 18, 24 and 32 threads to the inch. 4 Taps and 3 sets of Dies. }	each, 2 50

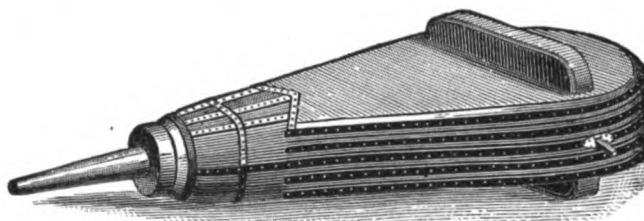
BLACKSMITHS' STOCKS AND DIES.**Plate 761.**

No. 1 . . .	{ Cuts 2 inch to 1 inch, right hand, 4½ and 7 threads to the inch Cuts 2 inch to 1 inch, left hand, 4½ and 7 threads to the inch 8 Taps and 4 pair of Dies. }	each, \$60 00
No. 2 . . .	{ Cuts 2 inch to ¾ inch, right hand, 4½, 6, 7 and 8 threads to the inch . . . 8 Taps and 4 pair of Dies. }	each, 60 00
No. 3 . . .	{ Cuts 1¾ inch to ¾ inch, right hand, 6 and 8 threads to the inch Cuts 1¾ inch to ¾ inch, left hand, 6 and 8 threads to the inch 8 Taps and 4 pair of Dies. }	each, 45 00
No. 4 . . .	{ Cuts 1¾ inch to ¾ inch, right hand, 6, 7, 8 and 9 threads to the inch . . . 8 Taps and 4 pair of Dies. }	each, 45 00
No. 5 . . .	{ Cuts 1½ inch to ¾ inch, right hand, 8 and 9 threads to the inch Cuts 1½ inch to ¾ inch, left hand, 8 and 9 threads to the inch 8 Taps and 4 pair of Dies. }	each, 35 00
No. 5½ . .	{ Cuts 1½ inch to ¾ inch, right hand, 6, 7, 8 and 9 threads to the inch . . . 8 Taps and 4 pair of Dies. }	each, 35 00
No. 7 . . .	{ Cuts 1¼ inch to ⅝ inch, right hand, 8 and 10 threads to the inch Cuts 1¼ inch to ⅝ inch, left hand, 8 threads to the inch 6 Taps and 3 pair of Dies. }	each, 12 00
No. 9 . . .	{ Cuts 1¼ inch to ½ inch, right hand, 8, 10 and 12 threads to the inch . . . 6 Taps and 3 pair of Dies. }	each, 12 00
No. 17 . .	{ Cuts 1 inch to ½ inch, right hand, 9 and 12 threads to the inch Cuts 1 inch to ¾ inch, left hand, 9 threads to the inch 6 Taps and 3 pair of Dies. }	each, 9 00
No. 19 . .	{ Cuts 1 inch to ⅜ inch, right hand, 9, 12 and 14 threads to the inch 6 Taps and 3 pair of Dies. }	each, 9 00
No. 25 . .	{ Cuts ¾ inch to ⅜ inch, right hand, 10 and 12 threads to the inch Cuts ¾ inch to ½ inch, left hand, 10 threads to the inch 6 Taps and 3 pair of Dies. }	each, 6 50
No. 27 . .	{ Cuts ¾ inch to ⅜ inch, right hand, 10, 12 and 16 threads to the inch . . . 6 Taps and 3 pair of Dies. }	each, 6 50
No. 45 . .	{ Cuts ⅝ inch to ⅙ inch, right hand, 12 and 16 threads to the inch Cuts ⅝ inch to ⅙ inch, left hand, 12 threads to the inch 6 Taps and 3 pair of Dies. }	each, 5 50
No. 47 . .	{ Cuts ⅝ inch to ¼ inch, right hand, 12, 14 and 18 threads to the inch . . . 6 Taps and 3 pair of Dies. }	each, 5 50
No. 49 . .	{ Cuts ½ inch to ¼ inch, right hand, 14 and 18 threads to the inch Cuts ½ inch to ⅙ inch, left hand, 14 threads to the inch 6 Taps and 3 pair of Dies. }	each, 4 50
No. 51 . .	{ Cuts ½ inch to ⅙ inch, right hand, 14, 18 and 22 threads to the inch . . . 6 Taps and 3 pair of Dies. }	each, 4 50
No. 60 . .	{ Cuts ¾ inch to ⅙ inch, right hand, 10, 12, 14 and 18 threads to the inch . 6 Taps and 4 pair of Dies. }	each, 6 50

BLACKSMITHS' DIES.**COMPLETE SET OF DIES.****PAIR OF DIES.****Plate 762.**

For No. 1 or 2 Stock	\$12 00
For No. 3 or 4 Stock	10 00
For No. 5 or 5½ Stock	8 00
For No. 6 Stock	6 00
For No. 7 or 9 Stock	3 50
For No. 11 or 15 Stock	3 00
For No. 17 or 19 Stock	2 50
For No. 21 or 23 Stock	2 00

For No. 25, 27 or 32 Stock	\$2 25
For No. 33 Stock	1 50
For No. 34 Stock	2 00
For No. 35, 37, 38, 41 or 42 Stock	1 50
For No. 45 or 47 Stock	2 25
For No. 49 or 51 Stock	2 00
For No. 53 Stock	1 50

EXCELSIOR BLACKSMITH BELLOWS.**Plate 763.****PRICE LIST—STANDARD.**

18 to 24 inch, each	\$10 00	36 inch, each	\$18 00
26 inch, each	11 00	38 inch, each	20 00
28 inch, each	12 00	40 inch, each	23 00
30 inch, each	13 00	42 inch, each	27 00
32 inch, each	14 00	44 inch, each	32 00
34 inch, each	16 00		

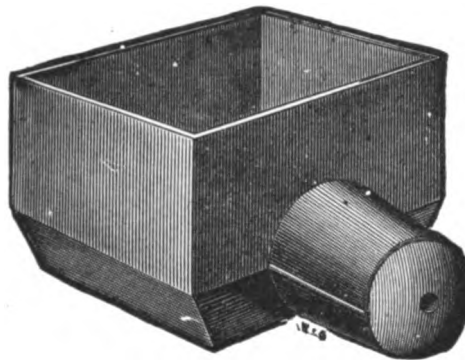
EXTRA LONG.

24 inch, each	\$12 00	36 inch, each	\$21 00
26 inch, each	13 00	38 inch, each	24 00
28 inch, each	14 00	40 inch, each	28 00
30 inch, each	15 00	42 inch, each	34 00
32 inch, each	17 00	44 inch, each	40 00
34 inch, each	19 00	50 inch, each	60 00

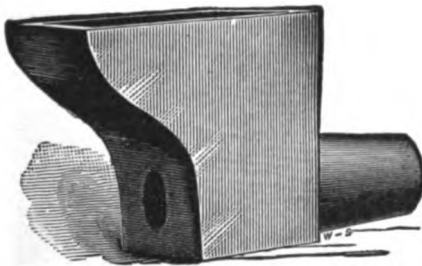
Standard Bellows always sent unless extra long is ordered.

EXCELSIOR MOULDERS' BELLOWS.

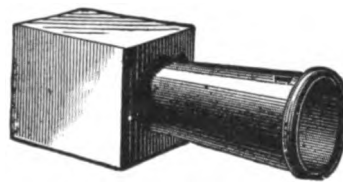
Size	9	10	12	14 in.
Per doz.	\$15 00	17 00	24 00	28 00

BOX WATER TUYERE IRONS.**Plate 764.**

Heavy, each \$7 00 Medium, each \$5 00

NEGRO-HEAD TUYERE IRONS.**Plate 765.**

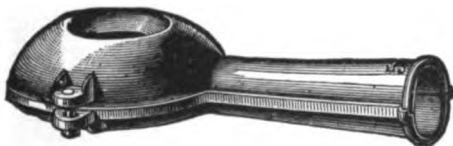
Western, each \$4 00

**Plate 766.**

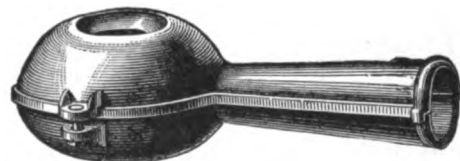
No. 1, weight 15 lbs., each \$1 00

No. 2, weight 22 lbs., each 1 50

No. 3, weight 42 lbs., each 2 00

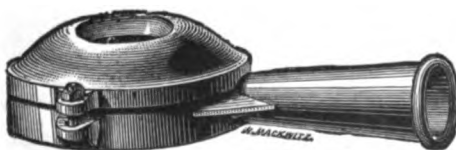
DUCK-NEST TUYERE IRONS.**Plate 767.**

No. 5, weight 12 lbs., per doz. \$10 50

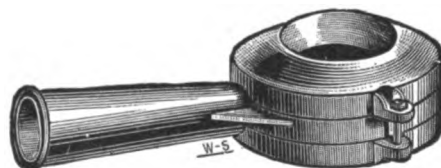
**Plate 768.**

No. 10, weight 17 lbs., per doz. \$13 50

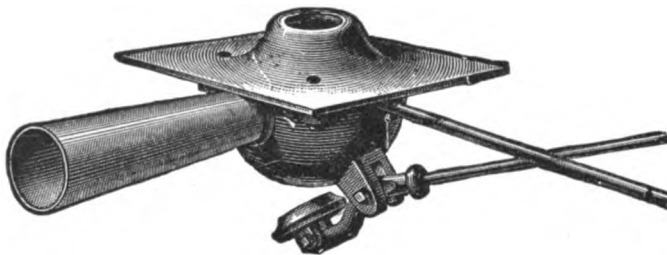
Same style as No. 20, double faced.

**Plate 769.**

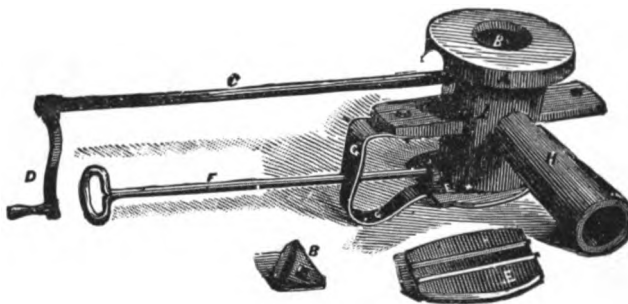
No. 20, weight 14 lbs., per doz \$13 00

**Plate 770.**

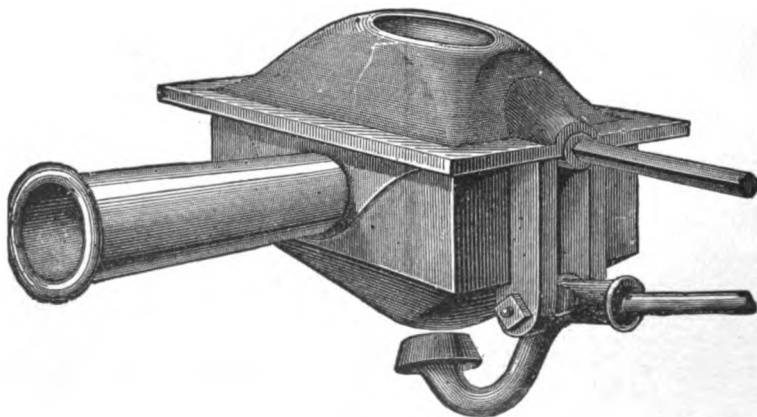
No. 30, weight 20 lbs., per doz \$16 00

TUYERE IRONS.**WARREN'S PATENT.****Plate 771.**

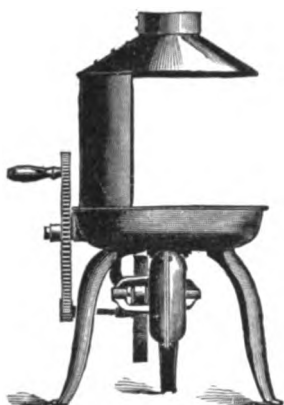
Warren's Patent, each \$2 75

NORTON'S PATENT.**Plate 772.**

Each \$2 25

DIAMOND F.**Plate 773.**

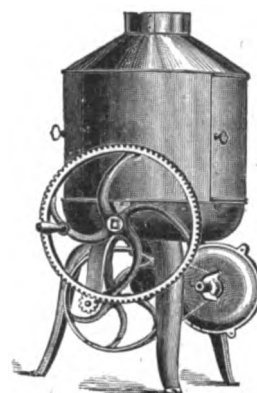
Each \$2 25

BUFFALO MINERS' AND FARMERS' FORGES.**Plate 774.**

No. 8—Height, 15 in.; hearth, 15 in. diam.; fan, 6 in.; weight, 50 lbs.

It has half-open hood, and is especially adapted for tinsmiths, jewelers, locksmiths, farmers, etc.

Forge No. 8 \$18 00

**Plate 775.**

No. 9—Size of hearth, 15 in. diameter; fan, 6 in.; weight, 55 lbs.

It has entirely closed hood, with large double door in front and single door in rear, so that it can be opened in front and rear.

Forge No. 9 \$20 00

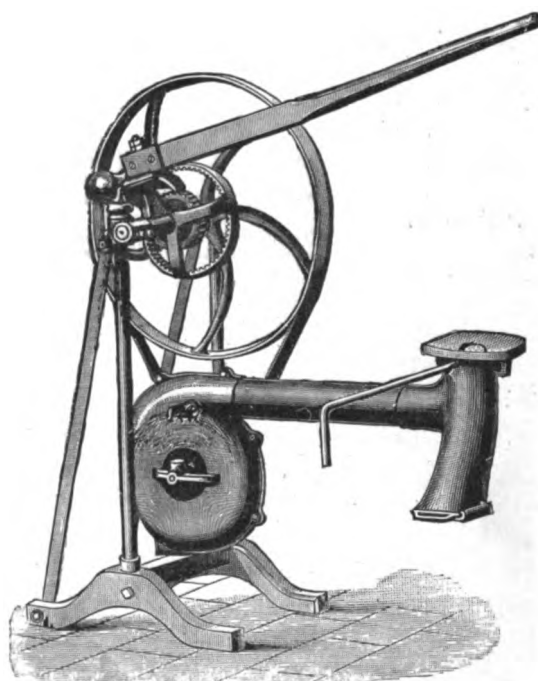
BUFFALO BLACKSMITHS' HAND BLOWERS.**Plate 776.**

Size of fan, 14 in.; weight, 110 lbs.; with tuyere, 130 lbs.

Blower No. 3, complete with tuyere . . . \$25 00

Blower No. 3, without tuyere 23 00

Made right or left hand.

**Plate 777.**

Size of fan, 14 in.; weight, 120 lbs.; with tuyere, 140 lbs.

Blower No. 01, with tuyere iron \$25 00

Blower No. 01, without tuyere iron 23 00

Made only right hand.

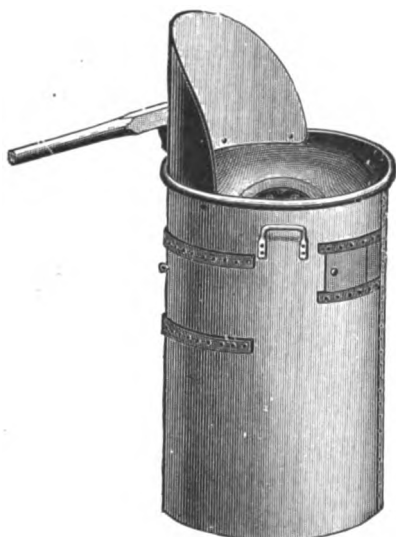


Plate 778.

RAILROAD AND BRIDGE BUILDERS' FORGE.

FORGE No. 10.

Size of hearth, 18 inches diameter; height, 32 inches; weight, 110 lbs.

This Forge is especially adapted for railroad repair work, iron bridge and tank builders. All the machinery being protected by an iron drum, there is no danger of breaking or getting out of order when transporting around the country.

Price \$32 00

MINERS' FORGE.

No. 11.

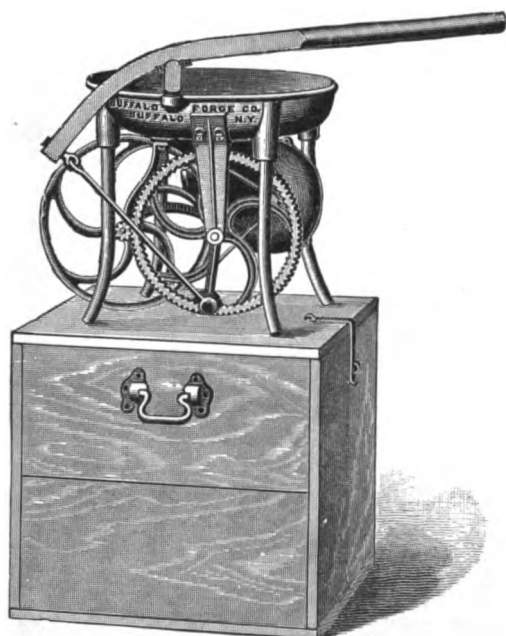


Plate 779.

FORGE No. 11.

This Forge is same size as our No. 5 Rivet Forge, but with shorter legs, making it more compact for transportation, and is recommended for prospecting purposes, and weighs but 60 lbs. with case.

The case affords ample room for full line of blacksmith's tools.

With case \$26 00

FORGE No. 5.

Height, 33 inches; size of hearth, 18 inches diameter; weight, 70 lbs.

Same capacity as No. 4, and is especially adapted for use of tank builders, elevated railroad builders, miners and prospectors.

Price \$24 00

RIVET FORGE.

No. 5.



Plate 780.

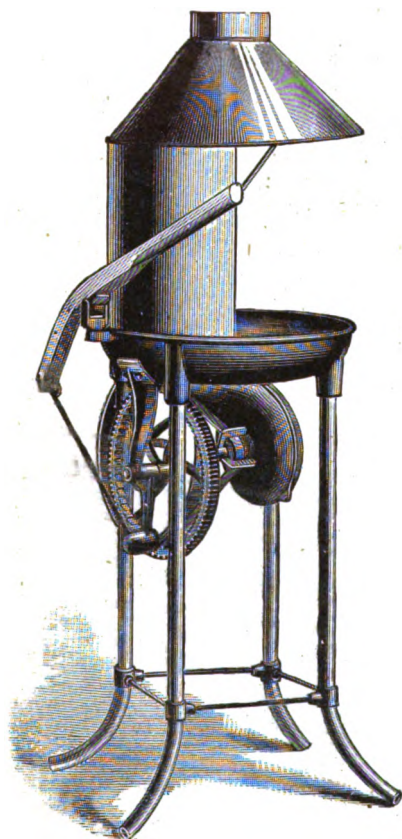
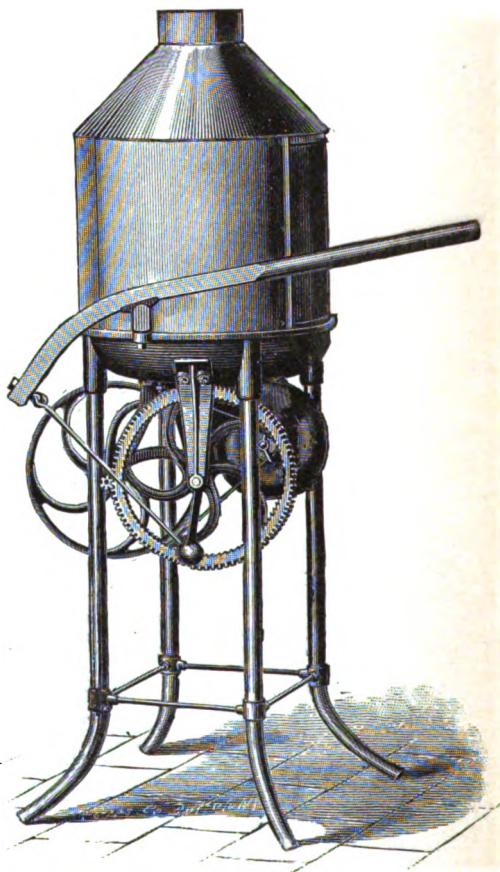
BUFFALO BOILER MAKERS' PORTABLE FORGE.**FORGE No. 3.****Plate 781.**

Price \$36 00

Forge No. 3.—Height, 29 in.; fan, 10 in.; hearth, 21 x 27 in.; weight, 130 lbs.

No. 3 has four swinging handles, for convenience of moving from place to place, with deep fire-place, and is peculiarly adapted for heating rivets, with capacity guaranteed sufficient for one boy to supply from three to four gangs of riveters.

It is especially intended for boiler makers, iron bridge and ship builders, railroads, tank builders, railroad contractors, miners, etc.

TOOL MAKERS' FORGE.**No. 4 WITH HOOD.****Plate 782.****JEWELERS' FORGE.****No. 6.****Plate 783.****FORGE No. 4.**

Half open hood; height, 33 inches; size of hearth, 18 inches diameter; weight, 75 lbs.

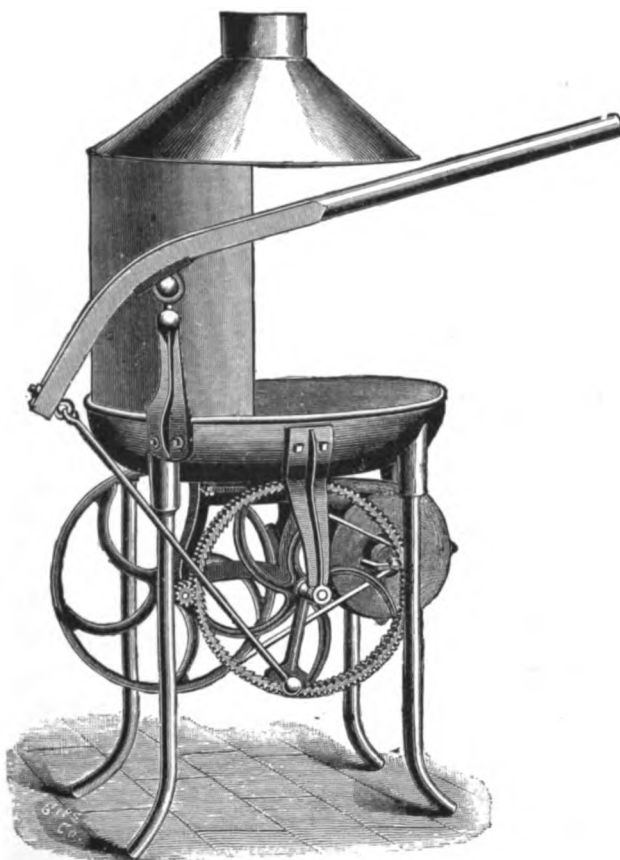
Price \$27 00

FORGE No. 6.

Closed hood; same capacity as Forge No. 4; weight, 80 lbs.

This Forge has closed hood, with large sliding door, thus preventing the escape of sparks or fumes and smoke when starting the fire.

Price \$30 00

BUFFALO MACHINISTS' PORTABLE FORGE.**FORGE No. 1, WITH HOOD.****Plate 784.**

Forge No. 1, with hood \$40 00

Height, 29 inches; fan, 10 inches; hearth, 21 x 27 inches; weight, 140 lbs.

This forge is guaranteed to produce a welding heat on 2½ to 3-inch iron in from five to ten minutes, and on heavier work, if required.

It is especially adapted for all kinds of tool work, machinists, plumbers, miners, marble works, millers, railroad repair shops, locksmiths, planters, and repairs for manufacturers in general.

BUFFALO MACHINISTS' PORTABLE FORGE.

FORGE No. 2.

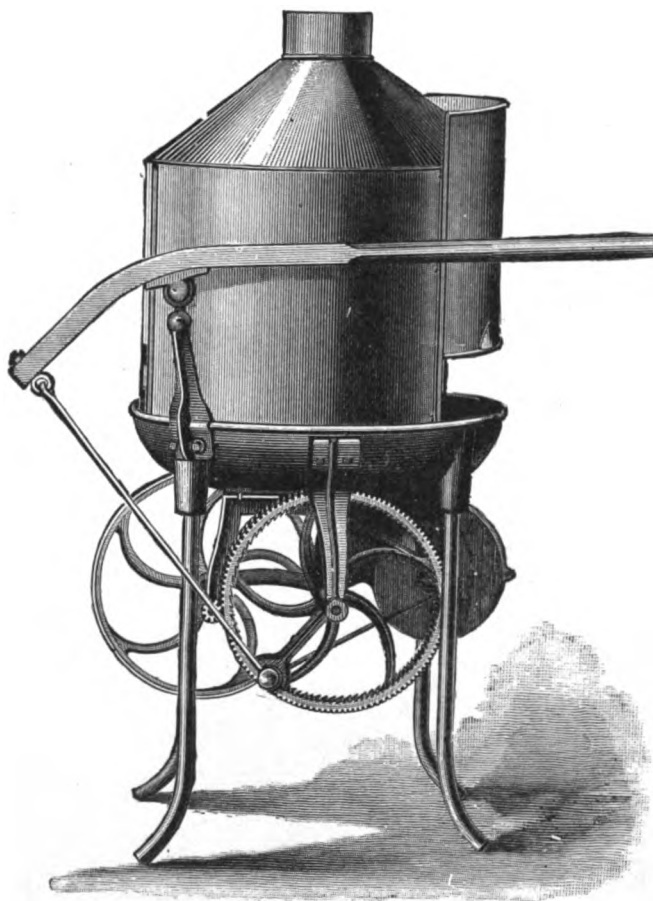


Plate 785.

Forge No. 2—Closed hood; same capacity as Machinists' Forge No. 1; weight, 150 lbs.

On our Forge No. 2 we place a closed hood, which is strongly made of sheet iron, completely enclosing the fire-place, and having a large sliding door in front, and small one in the rear, for manipulating the fire, etc. The closed hood prevents the escape of sparks or fumes and smoke, and is especially adapted for planing mills, furniture factories, saw mills, oil refineries, sugar works, varnish works, jewelers, dentists, locksmiths, tinsmiths, etc., also for annealing and refining metals.

Price \$42 00

THE STURTEVANT IMPROVED PORTABLE FORGE.

No. A 5.

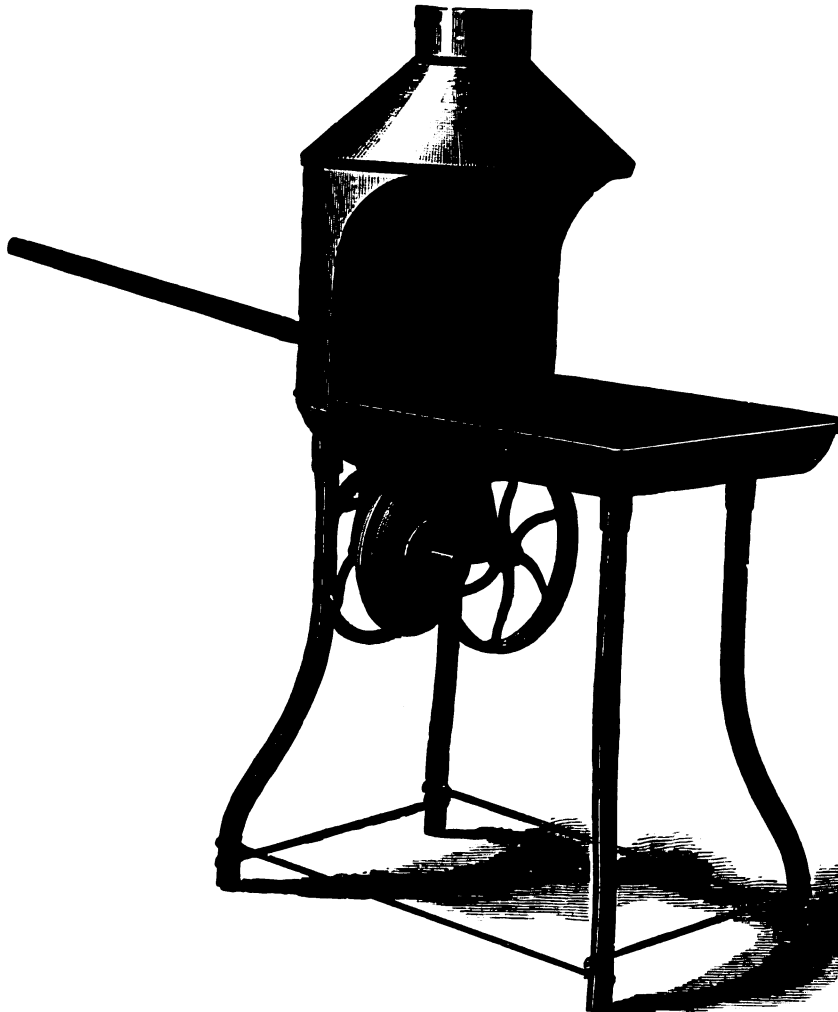


Plate 786.
STYLE A.

These forges are adapted for all light work, and are of particular value to wagon and carriage smiths, tool makers and blacksmiths, while upon the farm and plantation, in the shop and mill, on shipboard and in the manual training school, they have been very extensively introduced. They meet the requirements under all the conditions that require a small or medium-sized forge for heating, tempering, or the small repairs that become necessary in almost every line of work.

Size A 4 has wind-guard, but otherwise is exactly like A 5 as illustrated. A 6 and A 7 are respectively similar to, but larger than, A 4 and A 5.

No. of Forge	Height of Pan	Size of Pan	Diameter of Blower	Weight	Price
A 1	34½ in.	21 in. diameter.	10 in.	117 lbs.	\$16 00
A 2	34½ in.	21 in. diameter.	10 in.	127 lbs.	18 00
A 3	34½ in.	21 in. diameter.	10 in.	140 lbs.	20 00
A 4	32½ in.	22 x 33 in. diam.	10 in.	147 lbs.	20 00
A 5	32½ in.	22 x 33 in. diam.	10 in.	157 lbs.	22 00
A 6	32½ in.	26 x 38 in. diam.	10 in.	160 lbs.	23 00
A 7	32½ in.	26 x 38 in. diam.	10 in.	173 lbs.	25 00

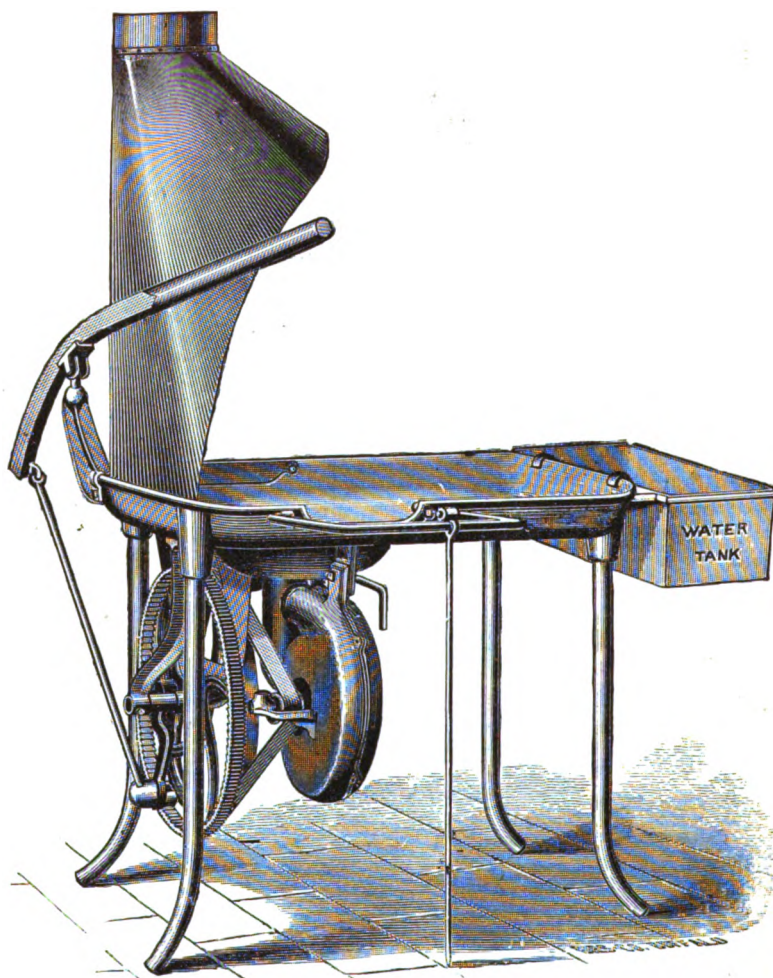
The sheet metal work of these forges is of heavy steel plate, this being much more durable than sheet iron. The running gear is heavy, strong and easily operated. The tuyere irons are of ample thickness and size to resist the action of the fire. The fire pan consists of a double plate with asbestos between, which prevents the heat from cracking the main pan or affecting the running gear. The Blower is made in the same manner as the regular Sturtevant Steel Pressure Blowers, with Babbitted journal boxes, steel shaft and galvanized steel blast wheel.

The pipes on hoods are 7 inches in diameter on all these sizes of forges.

These forges can be furnished with water tanks, the list price for tank being \$2.00.

BUFFALO BLACKSMITHS' FORGE.

FORGE No. 0, WITH WATER TANK.

**Plate 787.**

With water tank	\$54 00
Without water tank	50 00

Height, 30 in.; size of hearth, 28 x 40; fan, 14 in.; weight, 250 lbs.; with water tank, 300 lbs.

Forge No. 0 is guaranteed to produce a welding heat on 3-inch iron in five minutes, on 4-inch iron in ten minutes, and on heavier work, if desired, in the same proportion of time.

This forge is especially adapted for all kinds of heavy carriage and blacksmith work, having a large fire-pan with sufficient blast for the heaviest kind of work, and our improved revolving anticlinker ball tuyere, for regulating the blast; and with our water tank attached, makes the most complete forge ever offered to the trade.

Blacksmiths will find this the most economical, durable and easiest working forge ever introduced for their purpose, and far superior to the old-fashioned bellows and brick forge, requiring less than half the room.

THE STURTEVANT STEEL PRESSURE BLOWER.

FOR CUPOLA FURNACES AND FORGES.

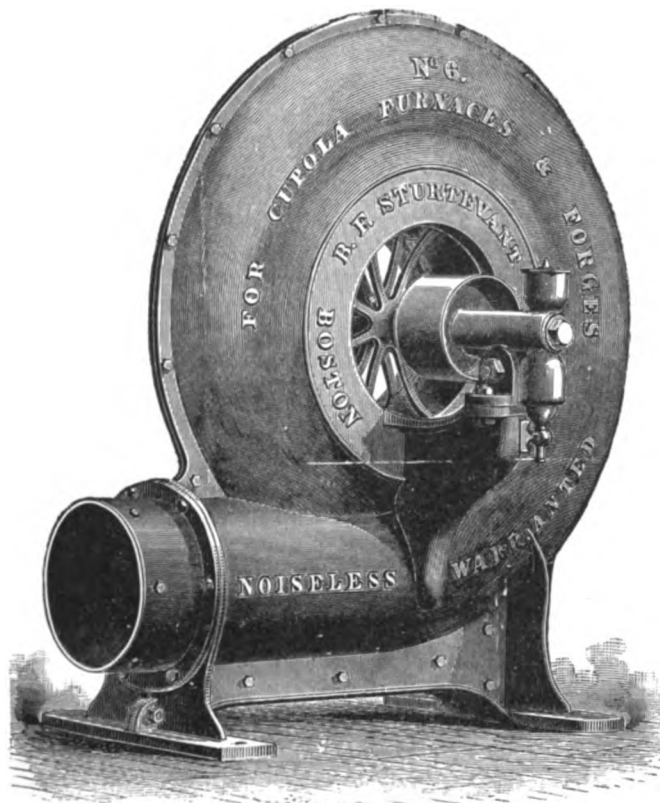


Plate 788.

These Blowers are made especially for iron foundries, and will produce stronger blast with the same expenditure of power than any other. In addition to their use for Cupola Furnaces and Forge Fires, they are very efficient machines for producing the blast in sand blast machines, for forcing air long distances, in connection with the pneumatic tube delivery system, or in any case where a high pressure or strong blast is required.

Great pains have been taken to simplify the construction of these Blowers, and to strengthen all parts. Any machinist of ordinary skill will readily understand how to adjust, keep in order and repair. They are built heavier and stronger than formerly, particularly in the running parts which are most subject to wear. The fact that these Blowers have been run continuously for twenty-five to thirty years, without any repairs whatever, is sufficient evidence of their durability.

Attention is called to the Journal Boxes, which contain many new and useful improvements over the old ones. Duplicate sets of these journals will be furnished to purchasers desiring them, at a small advance above cost.

No. of Blower	Outside Diam. of Outlet	Diam. of Pulley	Face of Pulley	Price	Number of Pulleys on Blower
0000	23 $\frac{3}{4}$	17 $\frac{7}{8}$	13 $\frac{3}{8}$	\$ 15 00	Nos. 0000 to 3 inclusive have only one pulley.
00	31 $\frac{1}{2}$	25 $\frac{3}{8}$	17 $\frac{7}{8}$	20 00	
0	4	3	21 $\frac{3}{8}$	28 00	
1	4 $\frac{7}{8}$	31 $\frac{1}{2}$	21 $\frac{3}{8}$	36 00	
2	53 $\frac{3}{8}$	37 $\frac{3}{8}$	25 $\frac{3}{8}$	44 00	
3	61 $\frac{1}{4}$	41 $\frac{1}{2}$	3	55 00	Nos. 4 to 10 inclusive have two pulleys.
4	73 $\frac{3}{8}$	5	31 $\frac{1}{2}$	70 00	
5	87 $\frac{3}{8}$	53 $\frac{3}{4}$	4	90 00	
6	101 $\frac{1}{4}$	63 $\frac{1}{4}$	41 $\frac{1}{2}$	115 00	
7	12	77 $\frac{3}{8}$	53 $\frac{3}{4}$	180 00	
8	137 $\frac{3}{8}$	91 $\frac{3}{8}$	61 $\frac{1}{4}$	225 00	
9	16	101 $\frac{3}{8}$	8	325 00	
10	181 $\frac{1}{2}$	125 $\frac{3}{8}$	93 $\frac{1}{4}$	450 00	

When one pulley only is used, it is placed on the right hand, as one faces the outlet, and the Blower is designated as right hand. When desired, the smaller sizes can be fitted with two pulleys. All sizes are regularly built to discharge horizontally at the bottom, but can be built to order to discharge either horizontally at the top, directly upward or directly downward.

In your correspondence, be sure and state what the Blowers are to be used for, whether Cupola Furnaces, Forges or other purposes. If for Cupolas, state diameter inside of lining; number and size of Tuyeres; quantity to be melted in given time; kind of fuel used; distance Blower sets from cupola; if for Forges, how many; kind of work; length of pipes, etc. If possible send a drawing of arrangement.

THE STURTEVANT COUNTER-SHAFT FOR STEEL PRESSURE BLOWERS.



Plate 789.

These Counter-Shafts are specially designed for driving the Sturtevant Steel Pressure Blowers. The Shafts and Pulleys are properly proportioned for the work, and all built of the best of materials. The Shafts are of Steel accurately turned to size, the Pulleys light but strong, and carefully balanced, and the boxes well Babbitted, easily adjustable and provided with Oil Drip Cups.

When so ordered, tight and loose Pulleys are furnished at a nominal additional price, in place of the usual Single Pulley driven by main belt.

Number of Blower	Diameter of Pulley driving Blower	Diameter of Pulley driven by Main Belt from Line Shaft	Diameter of Shaft	Price with One Driving Pulley	Price with Two Driving Pulleys	Number of Pulleys on Blower
{ 0000	14	5½, 6	¾	\$8 00	\$10 00	Nos. 0000 to 3 inclusive have only one Pulley.
0	16	6, 7	1	10 00	12 00	
1	18	7, 8	1½	12 00	15 00	
2	21	7, 8, 10	1¾	16 00	20 00	
3	24	8, 10, 12	1½	22 00	25 00	
4	28	10, 12, 14,	1¾	30 00	35 00	Nos. 4 to 10 inclusive have two pulleys.
5	32	12, 14, 16,	1¾	40 00	45 00	
6	36	12, 14, 16, 18	1½	50 00	60 00	
7	42	14, 16, 18, 20	2	68 00	80 00	
8, 9	48	18, 20, 22, 24	2½	85 00	100 00	
9, 10	54	18, 20, 22, 24	2½	100 00	125 00	

In ordering Blowers with Counter-Shaft and Pulleys, the purchaser should always be particular to give speed of main line of shafting and the largest Pulley that can be used thereon, so that Pulleys may be sent to suit the circumstances. It is desirable to get as much speed as possible from main line. Always use as large a pulley as possible on Counter-Shaft for main belt.

THE STURTEVANT MONOGRAM BLOWERS AND EXHAUSTERS.

BOTTOM HORIZONTAL DISCHARGE BLOWER.
RIGHT HAND.

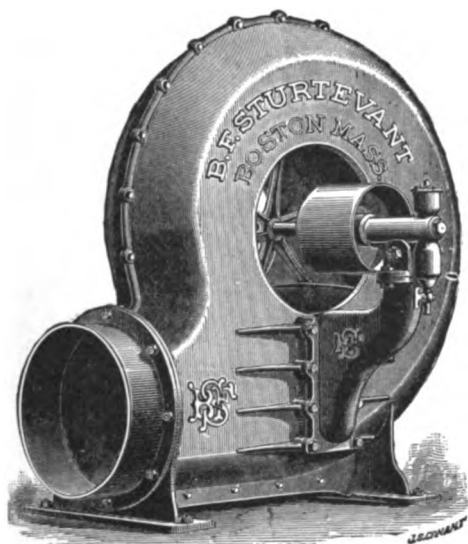


Plate 790.

UP BLAST BLOWER.
LEFT HAND.

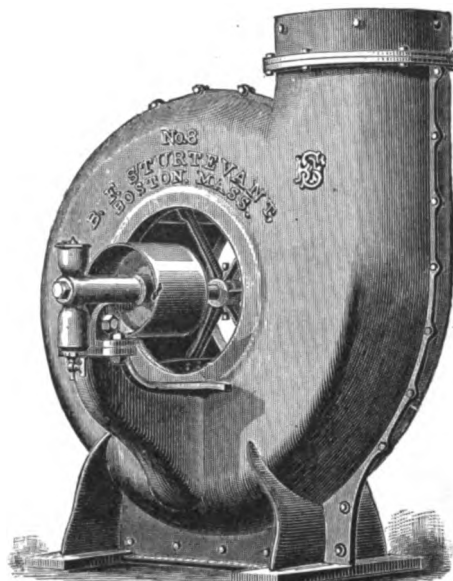


Plate 791.

These Fans all have the maker's Monogram, B. F. S., cast upon the side. The Journal Bearings upon the Blowers are of the same design as those used upon the Steel Pressure Blowers. The Exhausters are fitted with boxes of the type of those used upon the Planing Mill Exhausters.

When ordering a new Wheel to replace an old one, state the type of Fan for which it is desired; give the size number of the Fan cast upon its side as well as the shop number, which is stamped upon end of the Blower Boxes, or upon end of the Exhauster Shafts. The same instructions, regarding size and shop numbers, apply in ordering new Journal Boxes for repairs.

REDUCTION OF 22 PER CENT FROM FORMER LIST.

No. of Blower or Exhauster	Total Height	Outside Diameter of Inlet	Outside Diameter of Outlet	Diameter of Pulley	Face of Pulley	Revolutions per minute 2 oz. Blast, for Boiler fires	Revolutions per minute 4 oz. Blast, for Forge fires	Sq. ft. of Boiler Grate Surface supplied by Blower	Price
0000	10	3 $\frac{5}{8}$	2 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{1}{4}$	4,675	6,640	2	\$12 00
00	15	4 $\frac{7}{8}$	4 $\frac{1}{8}$	2 $\frac{5}{8}$	1 $\frac{7}{8}$	3,000	4,000	5	15 00
0	18	5 $\frac{3}{4}$	4 $\frac{3}{4}$	3	2 $\frac{1}{2}$	2,600	3,600	6	20 00
1	20	6 $\frac{1}{2}$	5 $\frac{3}{4}$	3 $\frac{1}{2}$	2 $\frac{1}{2}$	2,300	3,200	8	26 00
2	24	7 $\frac{1}{2}$	7 $\frac{1}{2}$	4 $\frac{3}{8}$	3 $\frac{1}{4}$	1,928	2,882	10	33 00
3	27	9	9	5 $\frac{1}{8}$	4	1,638	2,279	14	44 00
4	33	10 $\frac{1}{2}$	10 $\frac{3}{8}$	6	4 $\frac{3}{4}$	1,410	1,961	20	55 00
5	40	12 $\frac{1}{4}$	12 $\frac{1}{4}$	6 $\frac{7}{8}$	5 $\frac{1}{4}$	1,194	1,662	27	70 00
6	45	15	14 $\frac{5}{8}$	8	6 $\frac{1}{2}$	1,018	1,417	36	90 00
7	50	16 $\frac{5}{8}$	16 $\frac{5}{8}$	8 $\frac{7}{8}$	7 $\frac{1}{2}$	878	1,234	48	150 00
8	57	18 $\frac{5}{8}$	18 $\frac{3}{4}$	10 $\frac{1}{4}$	8 $\frac{7}{8}$	766	1,065	62	200 00
9	65	21 $\frac{1}{2}$	21 $\frac{3}{4}$	12	10 $\frac{1}{2}$	671	932	80	250 00
10	77	24 $\frac{1}{2}$	24 $\frac{3}{8}$	13 $\frac{3}{4}$	11 $\frac{1}{4}$	598	831	100	325 00

Nos. 7 to 10 are extra heavy. Monogram Blowers and Exhausters are regularly built with bottom horizontal discharge in all sizes, and with upward discharge in sizes 3 to 10 inclusive. Blowers are regularly built right hand, and only made left hand to order. Exhausters are regularly made either hand. Always state which hand and discharge, and whether Blower or Exhauster is wanted.

In ordering or asking for estimates, state the kind and amount of work Blower is expected to do. If for furnaces of any kind, give the square feet of grate surface; if for forges, give size and numbers; if for ventilation, give size of room (length, width and height) to be ventilated, and length of pipes in all cases. State what Exhausters are to be used for, and amount of work they are to do. If for dust or smoke from machines, give the number and size of machines, distance from machines to Exhauster, and also the distance the material is to be carried from Exhauster. A diagram showing location of machines, line shaft and direction top of shaft runs, is a great help.

THE STURTEVANT COUNTER-SHAFT FOR MONOGRAM BLOWERS AND EXHAUSTERS.



Plate 792.

These Counter-Shafts are specially designed for driving the Sturtevant Monogram Blowers and Exhausters. The shafts and pulleys are properly proportioned for the work, and all built of the best of materials. The shafts are of steel accurately turned to size, the pulleys light but strong, and carefully balanced, and the boxes well babbitted, easily adjusted and provided with oil drip cups.

When so ordered, tight and loose pulleys are furnished at a nominal additional price, in place of the usual single pulley driven by main belt

Number of Blower	Diameter of Pulley Driving Blower	Diameter of Pulley driven by main belt from line shaft	Diameter of shaft	Price with one driving pulley
0000 } 0 1 2 3 4 5 6 7 8, 9 9, 10	14 16 18 21 24 28 32 36 42 48 54	5½, 6 6, 7 7, 8 7, 8, 10 8, 10, 12 10, 12, 14 12, 14, 16 12, 14, 16, 18 14, 16, 18, 20 18, 20, 22, 24 18, 20, 22, 24	7⁄8 1 1⅛ 1¼ 1½ 1⅝ 1¾ 1⅞ 2 2⅛ 2⅞	\$ 8 00 10 00 12 00 16 00 22 00 30 00 40 00 50 00 68 00 85 00 100 00

In ordering Blowers or Exhausters, with Counter-Shaft and Pulleys, the purchaser should always be particular to give speed of main line of shafting, and the largest pulley that can be used thereon, so that pulleys may be sent to suit the circumstances. It is desirable to get as much speed as possible from main line. Always use as large a pulley as possible on Counter-Shaft for main belt.

THE STURTEVANT STEEL PLATE PLANING MILL EXHAUSTER.

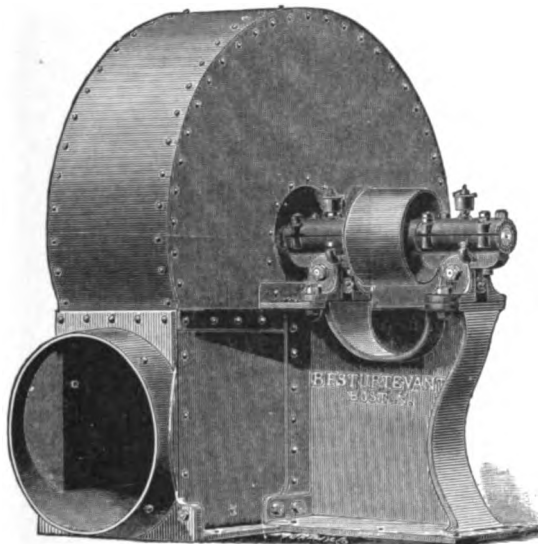


Plate 793.

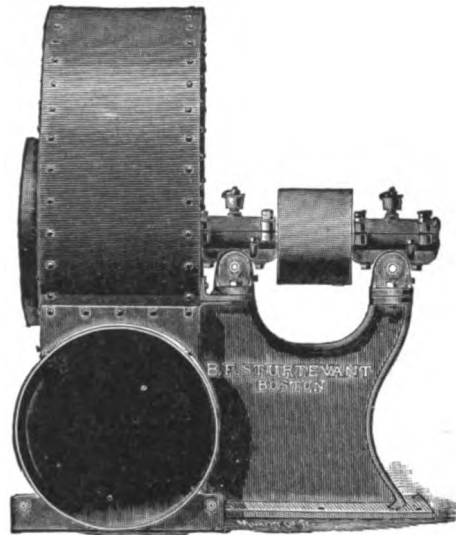


Plate 794.

These Fans are expressly made for removing chips, shavings, and sawdust from wood-working machinery. The shells of Exhausting Fans have been made heretofore, wholly, or in large part of cast-iron, with the hanger which supports the wheel, shaft and pulley, secured to the cast-iron side of the Exhauster. The whole strain from the belt is thus thrown upon this thin, brittle plate of cast-iron, and any sudden strain, due to a large knot or piece of wood getting into the Exhauster, is liable to completely wreck both wheel and shell. To do away with this danger, we manufacture a full line of Exhausting Fans, in which the whole machine, except the Bottom Plate, Mouth Piece and Standard for the Journal-Boxes, is made of steel, and the Wheel, Shaft and Pulley are supported by a Standard with a broad base resting on the floor, thus removing all strain from the side of the Shell, and providing a substantial support for the running parts of the Exhauster. Prices reduced 45½ per cent from former list.

Sizes	Height of Shell	Outside Diam. of Inlet	Outside Diam. of Outlet	Diam. and Face of Pulleys	Speed for Ordinary Work	Speed for Heavy Work	Price
30 in. . .	30 in. . .	11 in. . .	11 in. . .	5¼ x 5 . .	2,200 . .	2,600 . .	\$ 44 00
35 in. . .	35 in. . .	13 in. . .	13 in. . .	6 x 6 . .	1,800 . .	2,200 . .	55 00
40 in. . .	40 in. . .	15 in. . .	14¾ in. . .	6¾ x 6¾ . .	1,600 . .	1,900 . .	70 00
45 in. . .	45 in. . .	17 in. . .	16⅞ in. . .	8 x 7½ . .	1,475 . .	1,750 . .	90 00
50 in. . .	50 in. . .	19 in. . .	18¾ in. . .	8½ x 8½ . .	1,300 . .	1,550 . .	115 00
55 in. . .	55 in. . .	21 in. . .	20½ in. . .	9½ x 9½ . .	1,200 . .	1,400 . .	150 00
60 in. . .	60 in. . .	23 in. . .	22¾ in. . .	10¼ x 10 . .	1,100 . .	1,300 . .	185 00
70 in. . .	70 in. . .	25¾ in. . .	25¾ in. . .	12 x 10½ . .	950 . .	1,100 . .	250 00
80 in. . .	80 in. . .	30 in. . .	30 in. . .	13¾ x 11¼ . .	800 . .	950 . .	325 00

The cuts above show a Right Hand Exhauster with bottom horizontal discharge.

These Exhausters are made both Right and Left Hand. The use of one of the special forms often does away with an extra bend in the Delivery Pipe, and reduces the floor space required. It will be noticed that when a crossed belt is required to run a bottom horizontal, the substitution of a top horizontal will do away with this objection, and an open belt may be used, the air still being delivered in the same direction.

When ordering, or asking for estimates, state the character of the work to be done; whether wood is hard or soft, wet or dry; whether shavings are plentiful; long or short. State definitely the number, size and name of the machines, and send a clear diagram showing exact distance from machines to Exhauster; location of line shaft and direction in which the top turns; proposed location of Exhauster.

Be sure to state which hand Exhauster is wanted, Right or Left. By Right Hand is meant Pulley on right hand side as you stand facing the outlet, and by Left Hand, Pulley on left hand side.

THE STURTEVANT DOUBLE STEEL PLATE PLANING MILL EXHAUSTER.

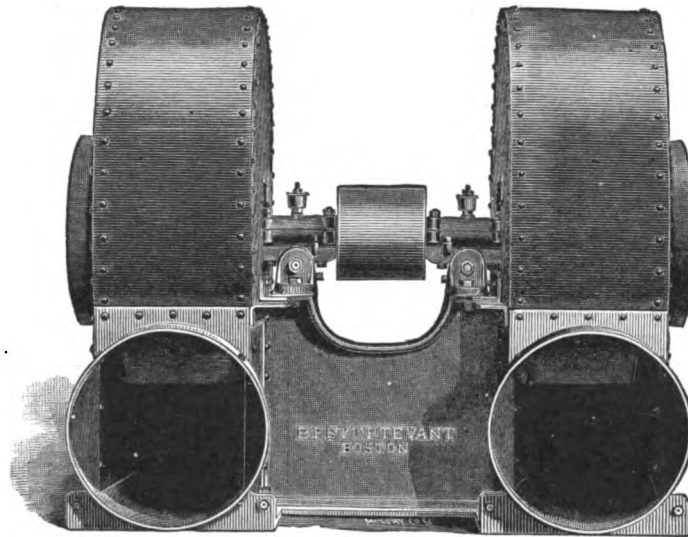


Plate 795.

The Steel Plate Shells obviate all danger of breakage by blocks or knots passing through the Exhauster.

The Blast Wheels in the single and double Exhausters are the same; they are made almost wholly of steel, which combines the minimum of weight with the maximum of strength and durability. The construction of these wheels is such as to enable them to produce blast or suction with the greatest economy. Everything being right, these fans will utilize 75 to 85 per cent of the power applied to them, only wasting 15 to 25 per cent in friction. We defy anyone to produce an Exhauster that will show better results than this. Ordinary Exhaust Fans do not utilize more than 40 to 60 per cent of the power applied. The Journal Boxes are our improved patent Brush Oiler Pattern, and together with the journals are finished in the best manner, which insures running constantly at high speed without heating. Prices reduced 30 per cent from former list.

Sizes	Height of Shell	Outside Diam. of Inlet	Outside Diam. of Outlet	Diam. and Face of Pulley	Speed for Ordinary Work	Speed for Heavy Work	Prices
30 in. . .	30 in. . .	11 in. . .	11 in. . .	6 $\frac{1}{8}$ x 6 . .	2,200 . .	2,600 . .	\$ 80 00
35 in. . .	35 in. . .	13 in. . .	13 in. . .	7 $\frac{1}{8}$ x 7 . .	1,800 . .	2,200 . .	90 00
40 in. . .	40 in. . .	15 in. . .	14 $\frac{3}{4}$ in. . .	8 x 8 . .	1,600 . .	1,900 . .	115 00
45 in. . .	45 in. . .	17 in. . .	16 $\frac{7}{8}$ in. . .	9 $\frac{1}{4}$ x 9 $\frac{1}{4}$. .	1,475 . .	1,750 . .	150 00
50 in. . .	50 in. . .	19 in. . .	18 $\frac{3}{4}$ in. . .	10 $\frac{1}{8}$ x 10 $\frac{1}{2}$. .	1,300 . .	1,550 . .	200 00
55 in. . .	55 in. . .	21 in. . .	20 $\frac{1}{2}$ in. . .	11 $\frac{1}{4}$ x 11 . .	1,200 . .	1,400 . .	250 00
60 in. . .	60 in. . .	23 in. . .	22 $\frac{3}{4}$ in. . .	12 x 11 $\frac{1}{2}$. .	1,100 . .	1,300 . .	300 00

GUARANTEE.—We guarantee that our Exhausters, when properly applied, will run with as little power—and as little noise, will do as much or more work in proportion to power used, are better proportioned, better made, more durable, and are sold at lower prices in proportion to size and capacity than those of any other make.

For certain positions a Double Exhauster is much to be preferred to a Single Exhauster. With the former, only a single belt and a single counter-shaft are required; less space is necessary, and when the exhaust pipes run in opposite directions they may be directly connected to the inlets of the fans (one upon either side) without the intervention of an elbow.

Double Exhausters are built either bottom or top horizontal or up discharge, and can be built to order in larger sizes than those given above.

THE STURTEVANT BLAST GATES.

LEVER PATTERN.

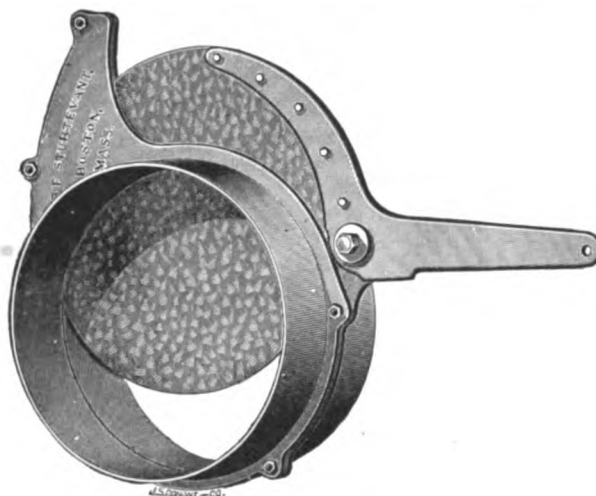


Plate 796.

SLIDE PATTERN.

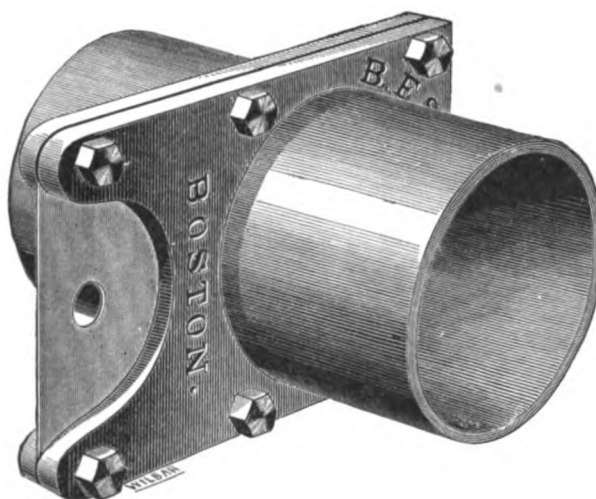


Plate 797.

These Blast Gates are designed for opening and closing pipes supplying blast to furnaces, forges, etc.; for use in exhaust piping systems, where shavings, smoke and the like are to be removed, or for regulating the distribution of heated air in connection with the Sturtevant Hot Blast Steam Heating System. Two styles can be furnished—the Lever Pattern and the Slide Pattern. The former can be readily manipulated by cords, and will be found very convenient in cases where it cannot be readily reached by the hand. Particular attention is called to the fact that the use of Blast Gates, to close pipes when not in use, insures a great saving in power, as a Blower requires far less power to drive it with the connections closed than with them open. Prices reduced 20 per cent from former list.

Size		Material		Price		Size		Material		Price
1½ inch	..	Composition	..	\$1 00	..	8 inch	..	Iron	..	\$ 3 50
2 inch	..	Composition	..	1 25	..	9 inch	..	Iron	..	4 00
2½ inch	..	Composition	..	1 50	..	10 inch	..	Iron	..	4 50
3 inch	..	Composition	..	1 75	..	12 inch	..	Iron	..	6 00
3½ inch	..	Composition	..	2 00	..	14 inch	..	Iron	..	8 00
4 inch	..	Iron	..	1 50	..	15 inch	..	Iron	..	10 00
4½ inch	..	Iron	..	1 75	..	16 inch	..	Iron	..	12 00
5 inch	..	Iron	..	2 00	..	18 inch	..	Iron	..	15 00
5½ inch	..	Iron	..	2 40	..	20 inch	..	Iron	..	18 00
6 inch	..	Iron	..	2 75	..	24 inch	..	Iron	..	20 00
7 inch	..	Iron	..	3 10	..	30 inch	..	Iron	..	25 00

Prices are the same for Lever Pattern and Slide Pattern. The size indicates the outside diameter of the collar of the Blast Gate where the pipe slips on.

DISC VENTILATING FAN.

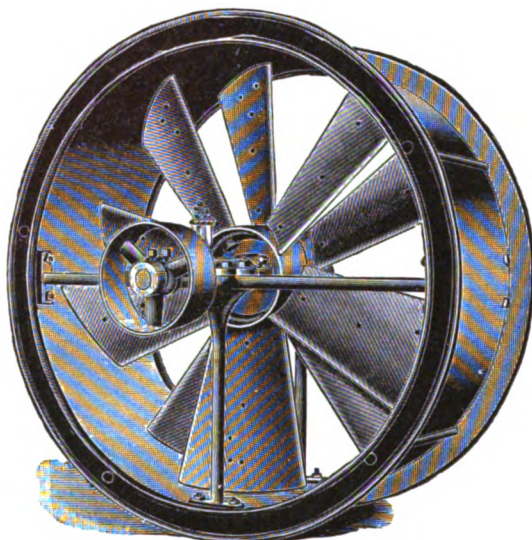


Plate 798.

The above cut represents our Double Disc Exhauster or Blast Ventilator Wheel. The advantages of the Double Wheel over an ordinary Single Wheel are many. First—A Double Wheel giving equal results is one-third less in diameter than the Single Wheel. Second—A Double Wheel requires one-third less power to drive it than a Single Wheel of equal capacity. Third—It is convenient of application, and its small diameter offers much less obstruction to light when placed in a window. This point is of particular importance. Fourth—The journals in all of our Disc Wheels are cast solidly in the frame, there being no loose journals (held in place by screws only) to work loose and wreck the entire Fan. Fifth—By the use of a center diaphragm, we in a great measure avoid back draught incident to most Ventilator Fans of this construction, and will always deliver the given quantity of air, irrespective of resistance or contra currents of air. We build them with a Single or Double Wheel. The Single Exhauster being the same in general appearance, but having only One Wheel.

PRICE LIST EXHAUSTERS.

Single Fan	Cubic Feet Air per minute	Price	Double Fan, Price	Size of Pulley	Average Speed
18 inch	6,000	\$ 35 00	\$ 40 00	5 x 2	1,300
24 inch	10,000	45 00	52 00	6 x 3	1,000
30 inch	15,000	60 00	65 00	8 x 3	900
36 inch	25,000	80 00	85 00	8 x 3	700
42 inch	30,000	100 00	105 00	8 x 4	600
48 inch	40,000	120 00	125 00	9 x 5	550
54 inch	50,000	160 00	165 00	10 x 5	500
60 inch	60,000	200 00	210 00	10 x 6	400
72 inch	85,000	250 00	265 00	12 x 6	350

FAN WITH DIRECT CONNECTED STEAM ENGINE.

24 inch Single Fan and Engine	\$125 00	24 inch Double Fan and Engine	\$135 00
30 inch Single Fan and Engine	150 00	30 inch Double Fan and Engine	160 00
36 inch Single Fan and Engine	175 00	36 inch Double Fan and Engine	185 00
42 inch Single Fan and Engine	200 00	42 inch Double Fan and Engine	210 00
48 inch Single Fan and Engine	250 00	48 inch Double Fan and Engine	260 00

Extra price for Fans for Horizontal Running.

POSITIVE BLAST BLOWERS.

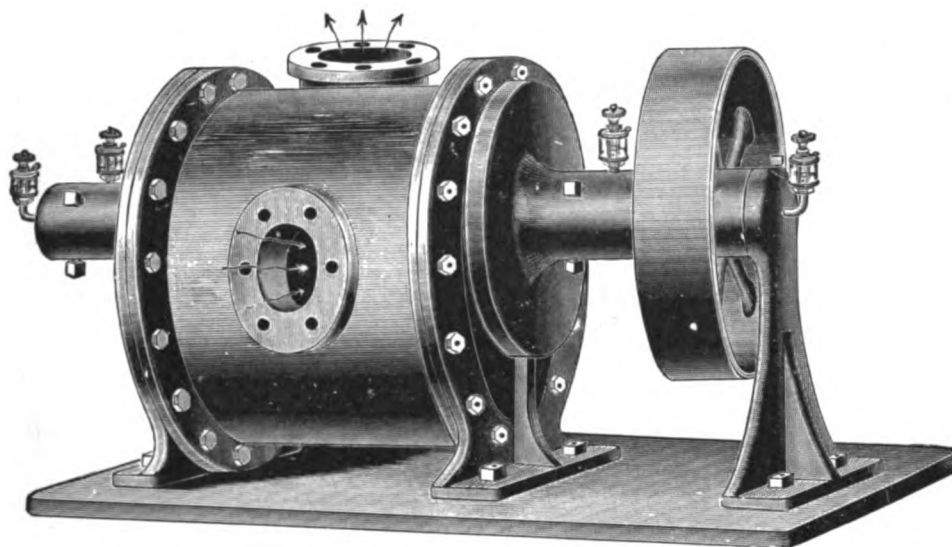


Plate 799.

OPERATION—The operation of our Blower is not on the Fan principle, in which pressure is obtained by a high velocity or speed, but when the air enters the case at the inlet, it is absolutely confined and must be forced forward until finally released at the outlet, where it must have escape or the Blower stop if outlet is closed. There is positively no chance for loss by backward escapement of air, after it once enters the inlet.

In many respects our Blower has points of superiority over any positive blower made, and we call your attention to the following points:

1. It has no gears whatever. No internal parts that require attention, adjustment or lubrication.
2. It has only two Journal Bearings that are external to the Blower Casing. They are Self-Oiling. Easy of adjustment.
3. Has no irregular internal surfaces that require contact to produce pressure, and add friction.
4. Operating parts are always in perfect balance, and may be safely run at a high speed, giving a proportionate increase in efficiency.

The Blowers are practically noiseless.

PRICE LIST POSITIVE BLAST BLOWERS.

No. of Blower	Discharge per Revolution	Price of Blower	Price of Blower with Engine on same bed	Diameter Inlet and outlet	Size of Driving Pulley	Height of Blower	Width of Blower Inside	Average Speed	H. P. at list speed
¼	¾ cub. ft.	\$ 100 00	.....	3 in.	14 x 4 in.	12 in.	10 in.	350	½
½	1¾ cub. ft.	150 00	.....	5 in.	16 x 5 in.	18 in.	12 in.	300	¾
1	4½ cub. ft.	200 00	\$ 450 00	8 in.	18 x 6 in.	24 in.	15 in.	275	2¾
2	7 cub. ft.	300 00	600 00	10 in.	22 x 6 in.	24 in.	24 in.	240	5
3	10 cub. ft.	375 00	800 00	12 in.	26 x 6 in.	30 in.	30 in.	200	7
4	16 cub. ft.	490 00	1,075 00	14 in.	30 x 8 in.	36 in.	36 in.	190	10
5	26 cub. ft.	700 00	1,500 00	16 in.	36 x 10 in.	42 in.	42 in.	170	15
6	45 cub. ft.	1,110 00	2,000 00	20 in.	42 x 10 in.	50 in.	48 in.	145	25
7	70 cub. ft.	1,400 00	3,250 00	24 in.	48 x 10 in.	50 in.	72 in.	130	38

All sizes above No. 3, have two Driving Pulleys.

BARREL TRUCKS.

NEW YORK PATTERN.

**Plate 800.**

Steel Nose Side Straps and Cross Bars. Steel Axle.

	Length of Handle	Width at Nose	Width at Upper Bar	Wheel	Weight	Price
No. 1	4 ft. 0 in.	13 in.	16 in.	6 diam., 1½ tread	50	\$ 7 00
No. 2	4 ft. 5 in.	14¾ in.	19½ in.	6¾ diam., 2 tread	65	9 50
No. 3	4 ft. 7 in.	15¾ in.	21¼ in.	7¾ diam., 2½ tread	92	10 00
No. 4	4 ft. 11 in.	16 in.	21¼ in.	8¾ diam., 2¾ tread	100	12 00
No. 5	5 ft. 4 in.	17½ in.	22¾ in.	10¾ diam., 2¾ tread	120	13 00

For all iron slats, add \$1.00 to list.

These Trucks are made of the best selected hickory, oak or ash lumber. Bolts pass through straps, tenons and handles. Axles turned, wheels bored, and all parts made in the most approved way. Finished with best agricultural coach varnish. Iron parts blacked.

No. 3.

BAG TRUCKS.

WITH BENT PLOW HANDLES.

No. 1.

**Plate 801.**

No. 1. Length of handle, 42 inches; width at nose, 11¼ inches; width at upper bar, 16¾ inches. Axle, 7/8 inch square. No. 35 wheel, 6 x 1½ inches. Weight, 29 pounds.

No. 3. Length of handle, 48 inches; width at nose, 15 inches; width at upper bar, 20½ inches. Axle, 1 inch square. Wheel 6¾ x 2 inches. Weight, 58 pounds.

No. 1	.....	\$5 00
No. 3	.....	9 00

**Plate 802.**

**Plate 803.**

FULL STRAPPED.

BARREL TRUCKS.**BOSTON PATTERN.**

Steel Nose, Side Straps and Cross Bars. Steel Axle.

	Length of Handles	Width at Nose	Width at Upper Bar	Wheel, Dia.	Tread	Weight	Price
No. 1.	4 ft. 2 in.	12 in.	18 in.	6 $\frac{7}{8}$	2	54	\$ 8 50
No. 2.	4 ft. 6 in.	13 $\frac{1}{2}$ in.	19 in.	7 $\frac{3}{4}$	2 $\frac{1}{2}$	65	11 00
No. 3.	4 ft. 9 in.	14 $\frac{3}{4}$ in.	20 $\frac{1}{2}$ in.	8 $\frac{3}{4}$	2 $\frac{3}{4}$	96	13 50
No. 4.	5 ft. 6 in.	15 $\frac{1}{4}$ in.	21 $\frac{3}{4}$ in.	10 $\frac{3}{4}$	2 $\frac{3}{4}$	105	16 50
No. 5.	6 ft. 1 in.	15 $\frac{1}{2}$ in.	23 $\frac{1}{2}$ in.	12	2 $\frac{7}{8}$	128	20 00

For all Iron Slats add \$1.00 to list.

These Trucks are made of the best selected hickory, oak or ash lumber. Bolts pass through straps, tenons and handles. Axles turned, Wheels bored, and all parts made in the most approved way. Finished with best agricultural coach varnish. Iron parts blacked.

**Plate 805.****STORE AND WAREHOUSE TRUCKS****BOSTON PATTERN.**

These Trucks are made of the best selected hickory, oak, or ash lumber. Bolts pass through straps, tenons, and handles. Axle and Collar forged from a single piece of wrought steel by special machinery. Legs braced, Axles turned, Wheels bored, and all parts made in the most approved way. Wood finished with best agricultural coach varnish, and iron parts blacked.

**Plate 804.**

Steel Nose and Side Straps. Steel Axles.

	Length of Handle	Width at Nose	Width at Upper Bar	Diameter of Wheel	How strapped	Weight, Pounds	Price
No. 1	4 ft. 2 in.	12 in.	18 in.	6 $\frac{7}{8}$ in.	Half strapped	43	\$ 6 50
No. 1	4 ft. 2 in.	12 in.	18 in.	6 $\frac{7}{8}$ in.	Full strapped	48	7 50
No. 2	4 ft. 6 in.	13 in.	19 in.	7 $\frac{3}{4}$ in.	Half strapped	55	8 50
No. 2	4 ft. 6 in.	13 in.	19 in.	7 $\frac{3}{4}$ in.	Full strapped	60	10 00
No. 3	4 ft. 9 in.	14 $\frac{3}{4}$ in.	20 $\frac{1}{2}$ in.	8 $\frac{3}{4}$ in.	Half strapped	85	11 00
No. 3	4 ft. 9 in.	14 $\frac{3}{4}$ in.	20 $\frac{1}{2}$ in.	8 $\frac{3}{4}$ in.	Full strapped	90	12 50
No. 4	5 ft. 6 in.	15 in.	21 $\frac{3}{4}$ in.	10 $\frac{3}{4}$ in.	Full strapped	98	15 50
No. 5	6 ft. 1 in.	15 $\frac{1}{8}$ in.	23 $\frac{3}{4}$ in.	12 in.	Full strapped	120	18 50
No. 6	6 ft. 4 in.	16 $\frac{1}{4}$ in.	25 in.	12 in.	Full strapped	135	24 00

Boston Pattern Trucks, Wheels inside, 10 per cent advance over above prices.

HOTEL TRUCKS.

WITH RUBBER BANDED WHEELS.

BENT HANDLE HOTEL.



Plate 806.

BAR HANDLE HOTEL
OR CARPET TRUCKS.

For Hotels, Carpet Stores, etc. Three Curved Steel Cross Bars.

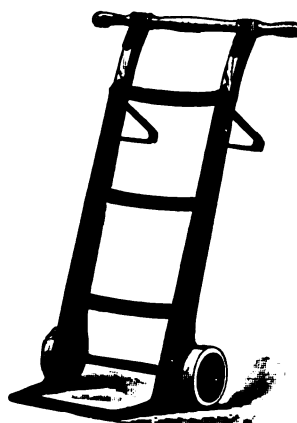


Plate 807.

Axles turned and Wheels bored; Steel Nose and Steel Axle.

	How Ironed	Length of Handle	Width	Diameter of Wheel	Weight	Price
No. 1	Half	3 ft. 8 in.	18 in.	6 in.	40 lbs.	\$ 10 00
No. 1	Full	3 ft. 8 in.	18 in.	6 in.	46 lbs.	11 00
No. 2	Half	4 ft. 3 in.	20 in.	8½ in.	51 lbs.	14 00
No. 2	Full	4 ft. 3 in.	20 in.	8½ in.	58 lbs.	15 00
Plate 807	Full	3 ft. 4 in.	14 in.	6 in.	37 lbs.	12 00

These Trucks are made of the best second growth ash or oak lumber. Bolts pass through iron, tenons, and handles.

TRUNK CARRIER.

WITH RUBBER BANDED WHEELS.

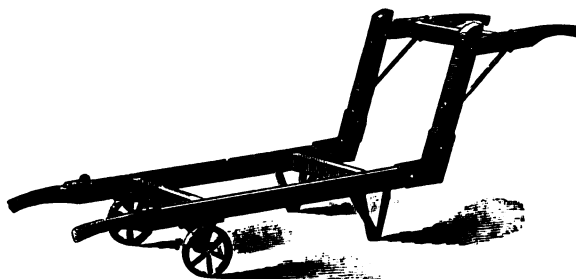


Plate 808.

For carrying trunks, boxes, etc., up or down stairs or steps. Very convenient for hotels, colleges, etc. Size, 21 inches wide by 76 inches long; height, 8 inches; Wheels, 6 inches in diameter, 1 inch face, ⅝ inch bore; weight, 50 pounds. Wheels can be attached to either end, as desired, but made regularly as shown in cut. Price, each, \$20.00.

WAREHOUSE AND STORE TRUCKS.

HALF IRONED.

WESTERN PATTERN.

FULL IRONED.

**Plate 809.**

	Length of Handle
No. 0	3 ft. 6 in.
No. 0	3 ft. 6 in.
No. 1	3 ft. 11 in.
No. 1	3 ft. 11 in.
No. 2	4 ft. 4 in.
No. 2	4 ft. 4 in.
No. 3	4 ft. 8 in.
No. 3	4 ft. 8 in.

Width
19 in.
19 in.
19 in.
19 in.
20 in.
20 in.
22 in.
22 in.

Diameter of Wheel
6 $\frac{7}{8}$ in.
6 $\frac{7}{8}$ in.
6 $\frac{7}{8}$ in.
6 $\frac{7}{8}$ in.
7 $\frac{3}{4}$ in.
7 $\frac{3}{4}$ in.
8 $\frac{3}{4}$ in.
8 $\frac{3}{4}$ in.

Kind
Half ironed
Full ironed
Half ironed
Full ironed
Half ironed
Full ironed
Half ironed
Full ironed

Plate 810.

Weight
42 lbs.
49 lbs.
44 lbs.
50 lbs.
56 lbs.
66 lbs.
77 lbs.
87 lbs.

Price
\$6 00
7 00
7 00
8 00
9 00
10 50
13 00
15 00

These Trucks are made of the best second growth hickory, ash or oak lumber, hickory being mostly used for handles. Bolts pass through iron, tenons and handles. All iron parts are heavier than ordinarily used. Axle and collar forged from one piece by special machinery.

Axles turned and Wheels bored. Steel Nose and Side Straps. Steel Axles. Steel Legs.

**RAILROAD AND PACKING HOUSE TRUCKS.**

WESTERN PATTERN.

RAILROAD AND PACKING HOUSE.

EXTRA IRONED RAILROAD, CENTER STRAP WELDED TO NOSE.

**Plate 811.**

	Length of Handle
No. 4	5 ft.
No. 4 Extra	5 ft.
No. 5	5 $\frac{1}{2}$ ft.

Width
24 in.
24 in.
25 in.

Diameter of Wheel
10 $\frac{3}{4}$ in.
10 $\frac{3}{4}$ in.
12 in.

These Trucks are made of the best selected second growth hickory, ash or oak lumber; hickory being mostly used for handles. Iron on cross pieces extends through to outside of handles, with bolts passing through iron, tenons and handles. All iron parts are heavier than ordinarily used. Axles and collars forged from one piece by special machinery. All parts made in the most substantial manner, and will stand the roughest usage. Extra heavy, full ironed, handle and cross-straps bolted through handles, axles turned and wheels bored. Steel nose and side straps; steel axles. No. 4 Extra has center strap welded to nose iron.

**Plate 812.**

Weight
120 lbs.
126 lbs.
150 lbs.

Price
\$20 00
22 00
24 00

STEAMBOAT TRUCK.

STEEL NOSE, STRAPS AND CROSS BARS, STEEL AXLE.

Length of handle, 5 feet; wheels, 12 inches in diameter, 3 inch face; nose, 9 inches long; width at nose, 17 inches; width at upper bar, 21 inches; axle, $1\frac{1}{4}$ inches square. Weight, 140 pounds.

Price \$26 00



Plate 813.



Plate 814.

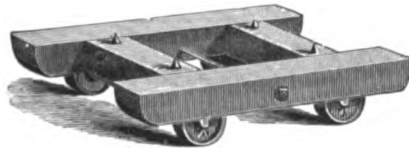
FEED TRUCK.

STEEL DASH.

The Wheels are set on Truck so that it is evenly balanced on Axle, and the largest load can be handled with ease. Heavily ironed. Best selected lumber. Bolts pass through Iron, Tenons and Handles. Handles well braced. Axles turned. Wheels bored.

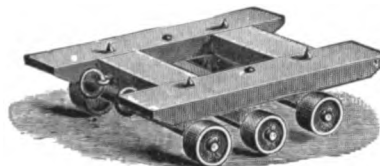
Length of handles, 6 feet 4 inches; width, 28 inches; height from floor, $17\frac{1}{2}$ inches; nose, 6 inches long; wheels, 14 inches in diameter, $2\frac{3}{8}$ inch face. Weight, 178 pounds.

Price \$30 00

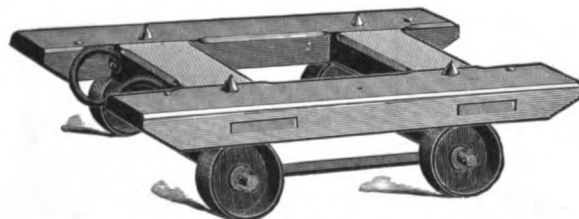
BOX TRUCKS.**Nos. 1 AND 2 TRUCKS.****Plate 815.**

Also furnished with Rubbered Wheels.

A low Truck, strong and well made, for handling large boxes or bales. Sharp cone-head bolts to prevent package from slipping. Axles turned and Wheels bored.

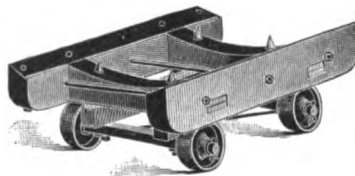
Nos. 3 AND 4. SIX-WHEEL BOX TRUCK.**Plate 816.**

Balanced on Center Wheels, which are set lower than end Wheels, so that Truck turns easily in any direction without injuring floor. Wood Bolsters between frame and axles. Axles turned and Wheels bored.

No. 5. BRACED BOX TRUCK.**Plate 817.**

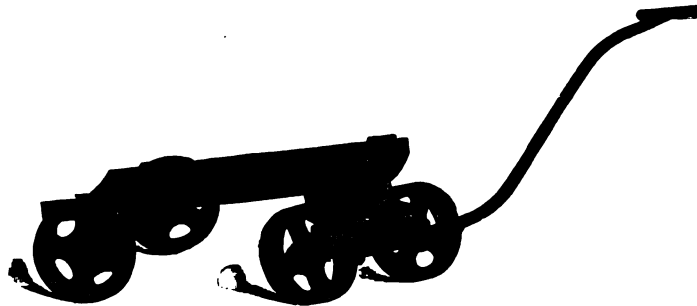
Extra iron braced between Axles. Hard wood, well made and finished. Axles turned and Wheels bored.

	Width	Length	Wheel	Weight	Price
No. 1	18 in.	18 in.	4 x 1 $\frac{3}{8}$ in.	28 lbs.	\$ 5 00
No. 2	18 in.	26 in.	4 x 1 $\frac{3}{8}$ in.	36 lbs.	6 00
No. 3, Six Wheel	16 in.	24 in.	3 $\frac{1}{4}$ x 2 $\frac{1}{4}$ in.	45 lbs.	8 00
No. 4, Six Wheel	22 in.	36 in.	3 $\frac{1}{4}$ x 2 $\frac{1}{4}$ in.	70 lbs.	10 00
No. 5, Braced	16 in.	24 in.	4 x 1 $\frac{3}{8}$ in.	34 lbs.	9 00

TOBACCO TRUCK.**Plate 818.**

For handling tobacco in hogsheads and large casks, etc. Full ironed on top. Axles cross-braced. Frame $27\frac{1}{2}$ inches long by $19\frac{1}{2}$ inches wide. Side Rails, $4\frac{1}{2} \times 2\frac{1}{2}$ inches, and $9\frac{1}{4}$ inches high. Wheels, $4\frac{5}{8}$ inches in diameter by 2 inch face. Axles turned and Wheels bored. Weight, 65 pounds.

Price \$12 00

DEPOT TOBACCO TRUCK.**Plate 819.**

For handling hogsheads of tobacco, casks of queensware, etc. The platform being only 7 inches above floor at rear end, and 14 inches in front, casks are easily "tipped" onto truck. Platform, 2 inch ash, $32\frac{1}{2}$ inches long, 18 inches wide. Two curved iron cross bands, $\frac{3}{8} \times 3$ inches, with four sharp cone head bolts in each, which hold casks in place. Wheels are extra heavy, 10 inches in diameter, 3 inch face. Wrought Iron Fifth Wheel, 11 inches in diameter. Iron Handle, U shaped at Axle, and attached by heavy bolt. Weight, 160 pounds.

Price \$25 00

BAR IRON TRUCK.**Plate 820.**

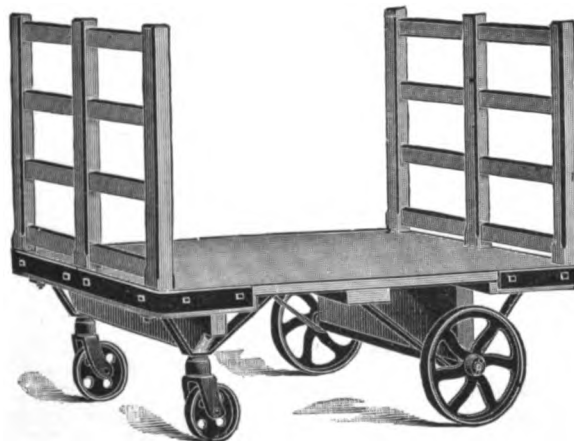
A very heavy, strong, and durable Truck. Platform, $25\frac{1}{2}$ inches wide by 63 inches long. Four Steel Pins, attached by chains. Iron Handle extends 59 inches in front of platform. Truck stands on platform scale 3 feet square. With Wrought Staggered Spoke Wheels, 3×20 inches, with extra 3 inch Wrought Iron Tire. Weight, 350 pounds.

Price \$50 00

COAL TRUCK.**Plate 821.**

Capacity, half ton. Box, length at bottom, 4 feet; over all, 5 feet; width at bottom, 2 feet; at top, $2\frac{1}{2}$ feet; depth inside, 2 feet. All of $1\frac{1}{2}$ oak. 4 Iron Straps ($1\frac{3}{4} \times \frac{1}{8}$) entire length on bottom, fastened by screws, extending up and bent over at both ends, and four inside braces ($1 \times \frac{1}{4}$) bolted through sides and bottom. Iron Strapped ($1\frac{1}{2} \times \frac{1}{8}$) all around top edge. Handles $\frac{5}{8}$ inch round iron, bolted on. All bolts inside box are countersunk. Wheels, $11\frac{3}{4}$ inches in diameter; 2 inch face. Castor Wheels, $6 \times 1\frac{3}{8}$ inches. Iron Axle, $1\frac{3}{8}$ inches square. Box painted brown outside, unpainted inside. Iron parts blacked. Weight, 325 pounds.

Price \$35 00

WAREHOUSE TRUCK.**Plate 822.**

Platform, 3×4 feet. Removable Wooden End Racks. Wheels, 12 inches in diameter by 2 inch face. For handling seed and grain in bags and for general use in seed warehouses. A light and handy Truck. Weight, 150 pounds.

Price \$34 00

LIGHT BAGGAGE BARROW.

SLOPING BACK PATTERN—COVERED TOP.

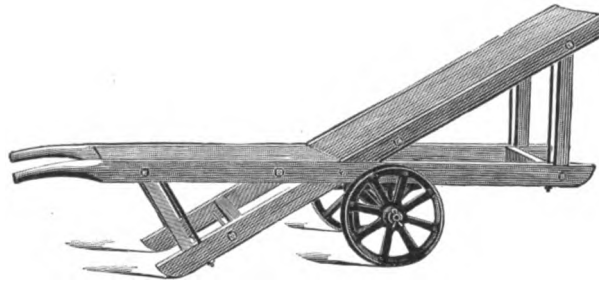


Plate 823.

A cheap and handy Barrow for use at small stations. Frame, best seasoned ash or oak; length 7 feet; width, 2 feet. Not ironed on top. Painted green and varnished. Cast Iron Wheels, 14 inches diameter, 2½ inch face. Axle, 1¼ inch round iron, 3 feet long. All iron parts painted black. Weight, 200 pounds.

Price \$25 00

ONE WHEEL BAGGAGE BARROW.

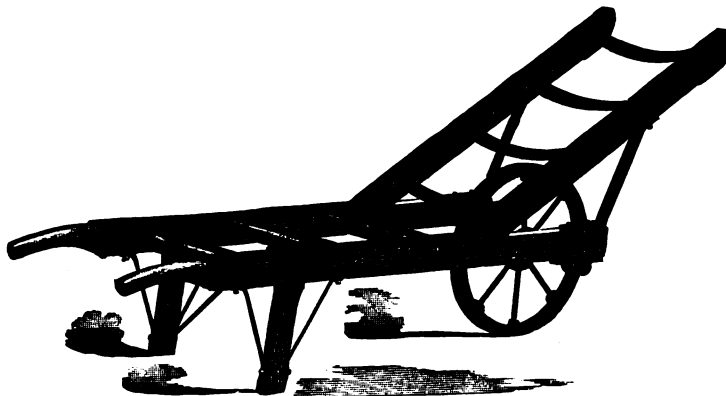
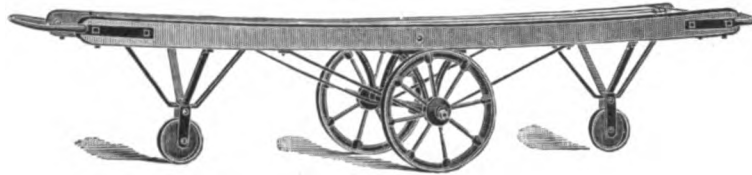


Plate 824.

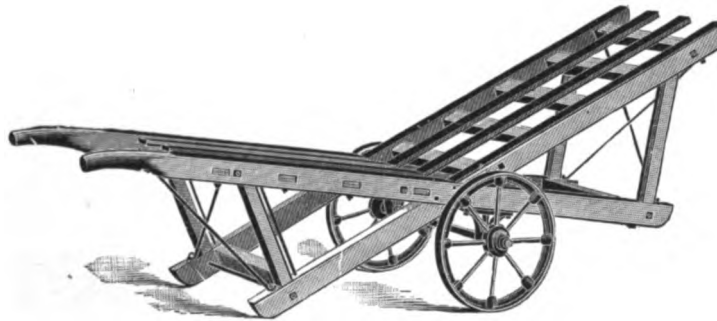
Sloping Back style. Full ironed on top. Dash has four Curved Iron Cross Bars. Length, 7 feet 10½ inches; width, 21½ inches; height at legs, 16 inches; height at top of dash, 39 inches; Improved Staggered Spoke Wheel, 22 inches diameter, 2 inch face, fastened solid to Axle, which is 1¼ inch round iron. Barrow painted dark green, striped and varnished. Weight, 200 pounds.

Price \$18 00

BAGGAGE BARROWS.**Plate 825.**

Curved Pattern. Improved Staggered Wrought Spoke Wheels. Painted Vermilion. Iron Blacked

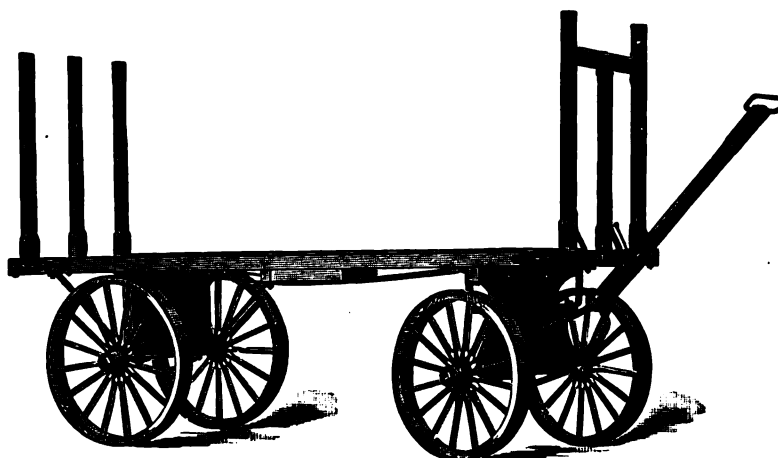
	Length	Width	Wheel	Weight	Price
No. 1	8 ft.	24 in.	20 x 2 in.	345 lbs.	\$40 00
No. 2	10 ft.	27 in.	20 x 2 in.	356 lbs.	45 00
No. 3	13 ft.	29 in.	20 x 2 in.	425 lbs.	55 00

**Plate 826.**

Sloping Back Pattern. Improved Staggered Wrought Spoke Wheels. Painted Green. Iron Blacked

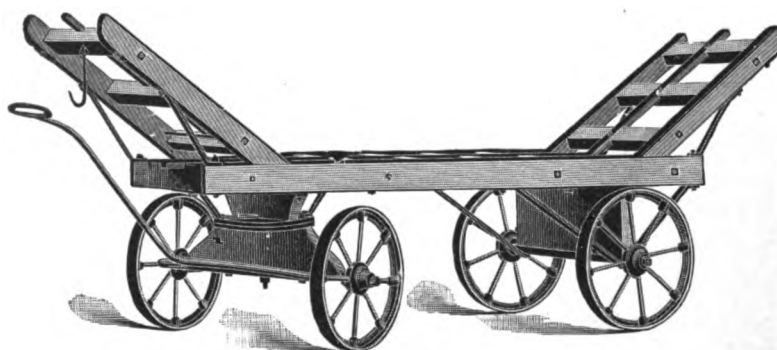
	Length	Width	Wheel	Weight	Price
No. 1	7 ft.	24 in.	17½ x 2 in.	217 lbs.	\$33 00
No. 2	9 ft.	27 in.	20 x 2 in.	303 lbs.	40 00
No. 3	10 ft.	30 in.	20 x 2 in.	340 lbs.	55 00

All Wheels used on these Barrows are bored true to centre, and Axles turned as carefully as a buggy axle.

EXPRESS AND BAGGAGE WAGONS.**IMPROVED PATTERN.****EXPRESS WAGON WITH SARVEN PATENT WOOD WHEELS.****Plate 827.**

Also furnished with "K. J." Wood or American Pattern Iron Wheels, when so ordered. Wrought Iron Fifth Wheel, 20 inches in diameter. Front Wheels, 28 inches in diameter; Rear Wheels, 31 inches in diameter. Platform, 10 feet long, 40 inches wide, 35 inches high. Weight, 670 pounds. Price \$100 00

These Wagons are of new and improved pattern. All material carefully selected. Thoroughly ironed and braced. Wheels bored and Axles turned. Well finished, and painted vermilion and green and striped and varnished. Extra strong and durable. Baggage Wagons furnished with "Sarven Patent" or "K. J." Wood Wheels, when desired.

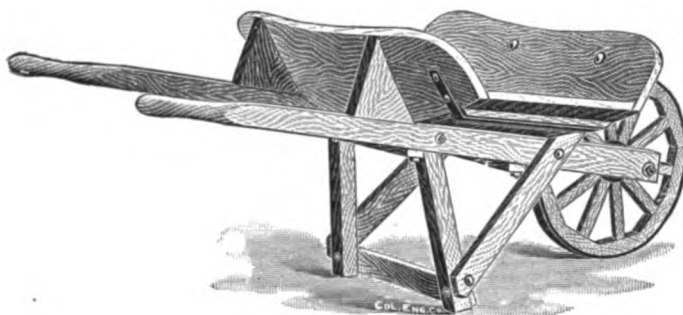
BAGGAGE WAGON WITH IMPROVED STAGGERED WROUGHT SPOKE WHEELS.**Plate 828.**

Wrought Iron Fifth Wheel, 20 inches in diameter.

Front Wheels, 20 inches in diameter; Rear Wheels, 22 inches in diameter.

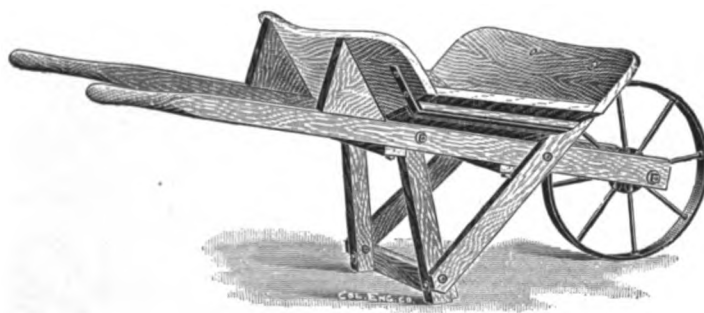
No. 1, 7 feet long, 26 inches wide; Dash, 28 inches long	\$70 00
No. 2, 10 feet long, 27 inches wide; Dash, 35 inches long	80 00
No. 3, 12 feet long, 32 inches wide; Dash, 44 inches long	90 00

Weight—No. 1, 475 pounds; No. 2, 600 pounds; No. 3, 725 pounds.

SCIOTO RAILROAD OR CANAL BARROW.**WITH JACOBS' PATENT No. 2 WOOD WHEEL UNPAINTED.****Plate 829.**

A thoroughly first-class bolted Barrow. Diameter of Wheel, 17 inches; tire $\frac{1}{4}$ x $1\frac{1}{8}$ inches; Spokes, $\frac{7}{8}$ x 1 inch; $\frac{1}{2}$ inch axle bolt. Unpainted. Full Sized Bent Tray, well planed, cleated, braced and bolted, as shown in cut. Legs and Cross-pieces gained, Leg Braces extending beyond the Handles, forming braces for the Tray, and bolted to it. Knocks down completely for shipping, and is easily set up. Weight per dozen, 576 lbs.

Price per dozen, Wood Wheel \$24 00

SCIOTO RAILROAD OR CANAL BARROW.**WITH No. 13-X LEWIS STEEL SPOKE WHEEL.****Plate 830.**

Same as above, except furnished with No. 13-X Lewis Steel Spoke Wheel. Diameter of Wheel, 16 $\frac{1}{2}$ inches; Spokes, $\frac{3}{8}$ inch round; Tire, $1\frac{3}{8}$ x $\frac{3}{8}$ inch; $\frac{1}{2}$ inch axle bolt. Painted black. Weight per dozen, 594 lbs.

Price per dozen, Lewis Steel Wheel \$27 00

JACOB'S BOLTED RAILROAD OR CANAL BARROW.

WITH WOOD WHEEL—PAINTED.

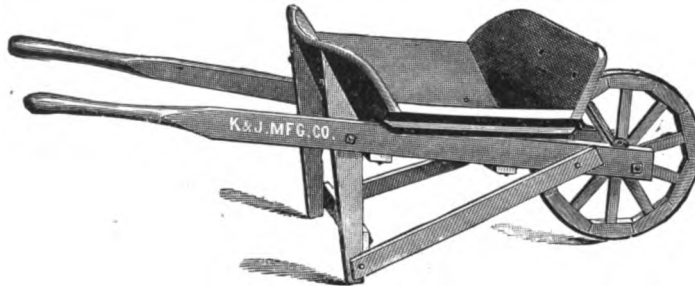


Plate 831.

Diameter of wheel, 17 inches; tire, $1\frac{1}{8}$ x $1\frac{1}{8}$ inches; spokes, $\frac{7}{8}$ x 1 inch; $\frac{1}{2}$ inch axle bolt. Full-sized bent tray, planed, cleated and strapped together, and well finished. Bolted securely to frame. The legs extend upward, serving as a brace to the bowl, to which they are bolted. They are also bolted to handles. This Barrow has all the merits of other Bolted Barrows, and, in addition has the Jacob's Patent Wheel, superior in every way to any wood wheel manufactured. The Wheel revolves on a fixed axle bolt, $\frac{1}{2}$ inch in diameter, similar to a buggy wheel, and runs true and evenly. The axle bolt holds the Barrow firmly together. The Barrow for railroad contractors. Will out-wear any other made, and displaces all others wherever introduced. Knocks down completely for shipping, and is easily set up. Weight, 50 lbs.

Wood Wheel, per doz. \$25 00

JACOB'S RAILROAD OR CANAL BARROW.

WITH STEEL SPOKE WHEEL.

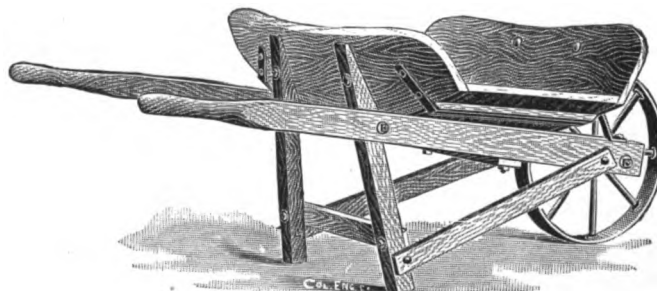
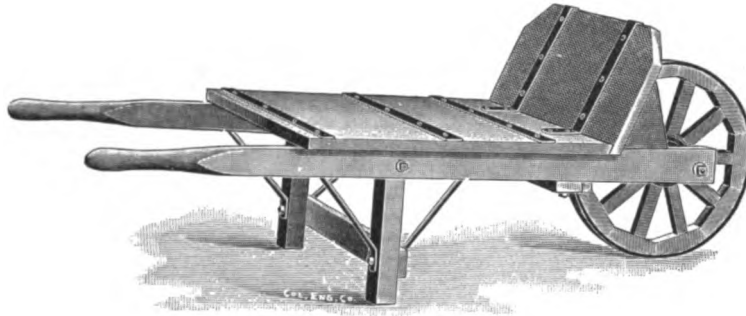


Plate 832.

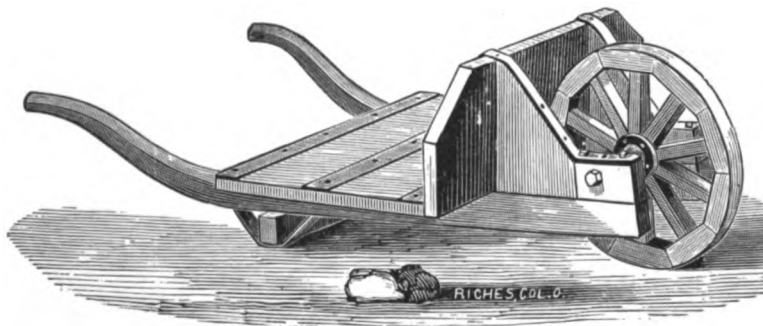
Same as above, but Steel Wheel. Diameter of wheel, $16\frac{1}{2}$ inches; wrought iron tire, $1\frac{3}{8}$ inches wide, $\frac{3}{8}$ inch thick; steel spokes, $\frac{5}{8}$ x $\frac{1}{4}$ inch; hub, 6 inches long, $\frac{1}{2}$ inch bore. Weight, 55 lbs.

Steel Wheel, per doz \$28 00

STRAIGHT HANDLE STONE BARROW.**WITH JACOBS' PATENT WHEEL.****Plate 833.**

For stone or pig metal. This is a strong, well made Barrow, iron strapped over the bottom, and well bolted together. The Iron Straps are now put on crosswise. Handles, 6 feet long; legs, 12 inches long; bottom, $1\frac{1}{4}$ inches thick by 23 inches wide by 27 inches long; dash, 10 inches high; wheel, 17 inches diameter; tire, $1\frac{3}{4} \times \frac{1}{8}$ inches; spokes, $1 \times 1\frac{1}{4}$ inches; axle bolt, $\frac{5}{8}$ inch; painted dark red; wheel lead color; weight, 64 pounds.

Per dozen, Wood Wheel	\$46 50
Per dozen, Steel Wheel	50 00

BENT HANDLE STONE BARROW.**WITH JACOBS' PATENT WHEEL.****Plate 834.**

Bent handles; thoroughly bolted; well ironed. We guarantee it to give satisfaction. Handles, 6 feet long; cross piece at legs, 2×3 inches; bottom, $1\frac{1}{4}$ inches thick by 26 inches wide by 27 inches long; dash, 11 inches high; wheel, 17 inches diameter; tire, $1\frac{3}{4} \times \frac{1}{8}$ inches; spokes, $1 \times 1\frac{1}{4}$ inches; axle bolt, $\frac{5}{8}$ inch; painted dark red; wheel lead color; Weight, 72 pounds. Either of the above Barrows furnished with Lewis or Jacobs' Patent Steel Spoke Wheel, when so ordered, $16\frac{1}{2}$ inches diameter; tire, $1\frac{3}{4} \times \frac{3}{8}$ inches.

Per dozen, Wood Wheel	\$56 00
Per dozen, Steel Wheel	58 00

STEEL BOTTOM STONE BARROW.

WITH PATENT STEEL-SPOKE WHEEL,

FOR STONE OR PIG METAL.

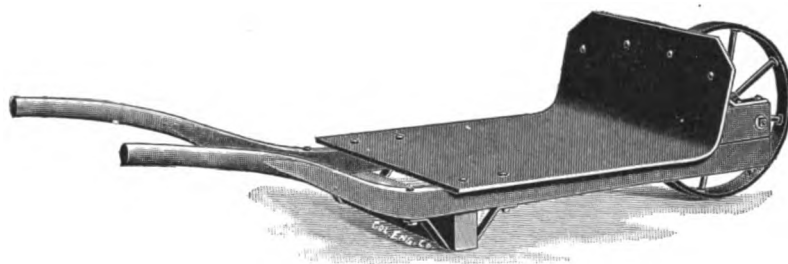


Plate 835.

The strongest and best Stone Barrow manufactured. Bottom and dash formed of one plate of steel, $\frac{1}{4}$ inch thick, 26 inches wide by 27 inches long; dash, 9 inches high; handles, 2 x 3 inches, 6 feet long; wheel, 16 $\frac{1}{2}$ inches in diameter; tire, 1 $\frac{3}{4}$ x $\frac{3}{8}$ inches, and painted black. Weight, 100 lbs.

Each \$9 00

TUBULAR PIG METAL BARROW.

WITH PATENT STEEL WHEEL.



Plate 836.

Bottom made of $\frac{1}{4}$ inch steel, 22 inches wide at handles by 25 inches long; dash, 20 inches wide at top and 14 inches high; side straps, $\frac{3}{8}$ x 1 $\frac{3}{8}$ inch iron; wheels, 16 $\frac{1}{2}$ inches diameter; tire, 1 $\frac{3}{4}$ x $\frac{3}{8}$ inches. Weight of Barrow, 110 lbs.

Each \$18 00

THE PAN-AMERICAN STEEL TRAY BARROWS.

WITH LEWIS ROUND STEEL SPOKE WHEEL.

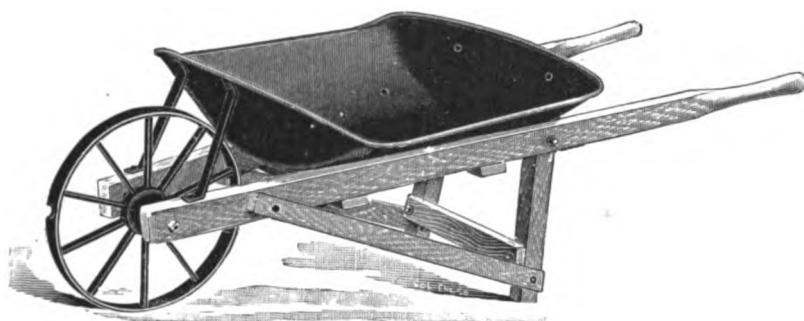


Plate 837.

Specially designed for the export trade—Steel vs. Wood—the wood tray must go. The most substantial, cheapest, and best Steel Tray Barrow yet manufactured. Specially adapted for heavy work. No. 13X Lewis Steel Wheel, 16½ inches diameter; Tire, 1⅜ x ⅜ inches; steel spokes, ⅜ inch round.

WITH JACOBS' PATENT WOOD WHEEL.



Plate 838.

The Tray of No. 15 best Steel, pressed from a single sheet, without joint, seam or rivet. Stronger and more durable than riveted iron trays of same thickness. The flange of Tray is turned over a 1⅝ steel rod, which passes entirely around the Tray, giving a smooth finish to the edge of the Bowl, preventing breaking, and stiffening and strengthening it. Size of Tray, greatest length, 32 inches; greatest width, 33 inches; depth at Wheel end, 11 inches; depth at Handle end, 7½ inches. The Wheels are so constructed, having the Spokes tightened from the center, that it is impossible for Tires to come off or Spokes to be loosened. These Wheels revolve on a fixed Shaft or Axle Bolt, similar to a buggy wheel, and run true and evenly, and the Axle Shaft serves as a brace to the Handles. Wood Wheels, 17 inches diameter; Tire, 1⅜ x 1⅝ inches.

Each, with Steel Wheel	\$7 00
Each, with Wood Wheel.	6 00

COLUMBUS STEEL TRAY WHEELBARROWS.

WITH LEWIS OR JACOBS' PATENT WHEEL.

No. 1.

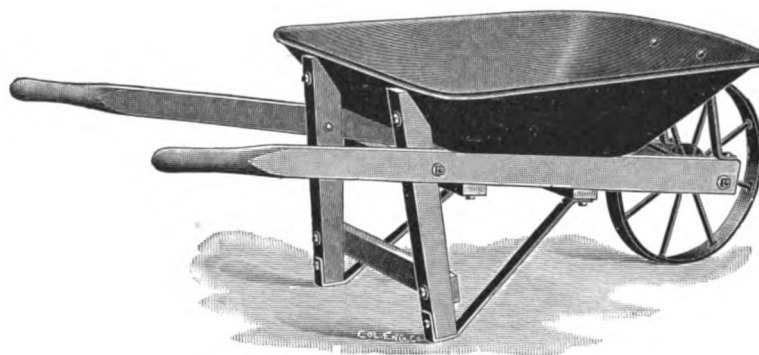


Plate 839.

For earth, sand, ore, cinders and foundry use.

Wheel, $16\frac{1}{2}$ inches diameter; Tire, $1\frac{3}{8} \times \frac{3}{8}$ inches.

Tray of No. 15 Steel; flange turned over a $\frac{1}{4}$ inch steel rod, passing entirely around the Tray, giving a smooth finish to the edge, preventing breaking, and stiffening and strengthening the Tray.

Tray and Wheel painted black; Frame, brown.

No. 1. Greatest width of Tray, $28\frac{1}{2}$ inches; greatest length, $32\frac{1}{2}$ inches; greatest depth, 7 inches. Capacity, 3 cubic feet. Weight, complete, 57 lbs.

No. 2. Greatest width of Tray, $28\frac{1}{2}$ inches; greatest length, 36 inches; greatest depth, $8\frac{1}{2}$ inches. Capacity, 4 cubic feet. Weight, complete, 58 lbs.

No. 2.

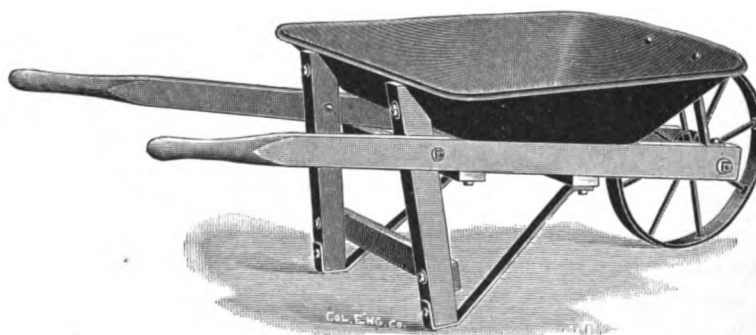


Plate 840.

For coal, manure, cinders, ashes, etc.

Each, No. 1, with Steel Wheel	..... \$7 00
Each, No. 2, with Steel Wheel	..... 8 75

COLUMBUS STEEL TRAY BARROW.

WITH PATENT STEEL WHEEL.

No. 3. COAL OR COKE BARROW.

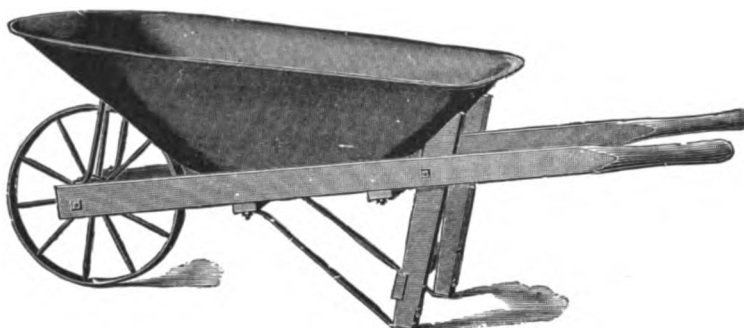


Plate 841.

Tray of No. 15 steel. Capacity, 400 to 450 lbs. coal, or $3\frac{1}{2}$ bushels coke or charcoal, or 6 cubic feet of earth. Greatest width of tray, 33 inches; greatest length, 42 inches; greatest depth, $11\frac{1}{2}$ inches. Bottom, 19 inches long, 18 inches wide at handle and 14 inches wide at wheel. Wheel, $16\frac{1}{2}$ inches diameter; tire, $1\frac{3}{8} \times \frac{3}{8}$ inches. Tray and wheel painted black; frame, brown. Weight, 65 lbs.

Each \$10 50

COLUMBUS TUBULAR STEEL WHEELBARROW.

STEEL DIRT BARROW.



Plate 842.

The No. 14 Lewis Steel Wheels used with these Barrows are $16\frac{1}{2}$ inches in diameter, with iron tire $1\frac{1}{2} \times \frac{3}{8}$ inches, and steel spokes $\frac{1}{2}$ inch round. These Barrows are intended for moving earth, sand, gravel, mortar, etc. For the heaviest work in mines, quarries, etc., we recommend our Tubular Mining or General Purpose Steel Barrows shown on another page.

No. 4, Tray made of No. 15 steel, capacity 3 cubic feet of earth, suitable for light work, as carrying loose earth, sand, etc.; weight of Barrow, 70 lbs., each \$10 75
 No. $4\frac{1}{2}$, Tray made of No. 14 steel, capacity 3 cubic feet of earth; weight of Barrow, 75 lbs., each . 11 50
 No. 5, Tray made of No. 14 steel, capacity 4 cubic feet of earth; weight of Barrow, 78 lbs., each . . 13 50

COLUMBUS TUBULAR STEEL WHEELBARROWS.

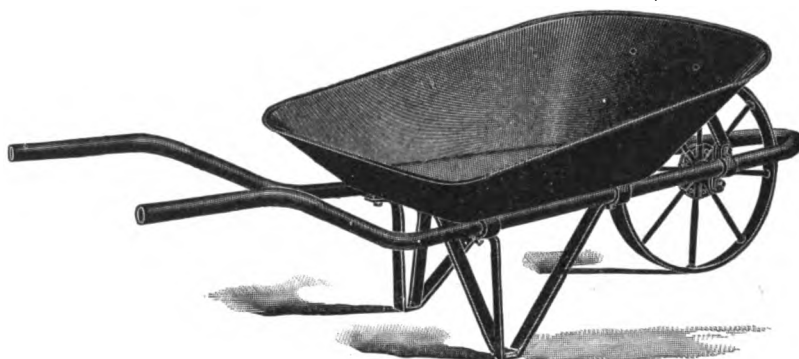


Plate 843.

The No. 15 Lewis Steel Wheels with which these Barrows are furnished are 16½ inches in diameter, with Iron Tire 1¾ x ¾ inches, and Steel Spoke ½ inch round, and extra heavy Malleable Iron Hubs. These Barrows have extra heavy leg braces, are intended for hard usage, and are the best general purpose all-metal Barrows manufactured.

	Tray	Capacity	Weight	Price, each
No. 6	No. 14 Steel	3 feet	80 lbs.	\$12 25
No. 7	No. 14 Steel	4 feet	87 lbs.	14 25
No. 8	No. 12 Steel	3 feet	90 lbs.	14 00
No. 9	No. 12 Steel	4 feet	97 lbs.	16 00

COAL AND COKE BARROW.

WITH NO. 15 LEWIS ROUND STEEL SPOKE WHEEL.

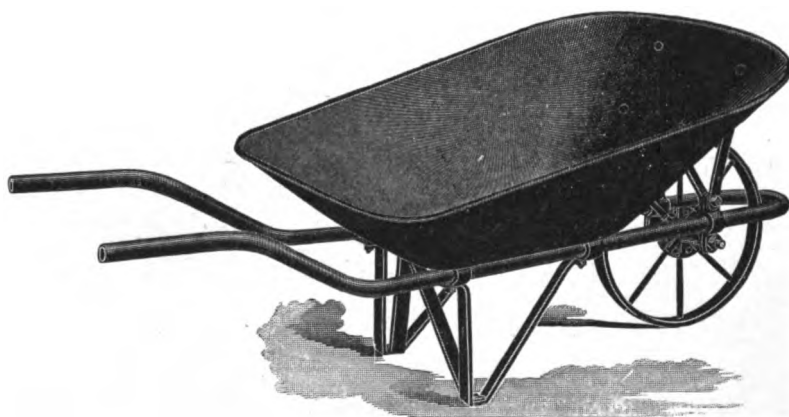
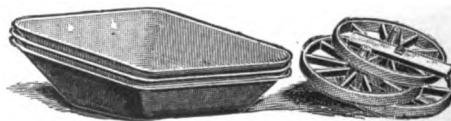


Plate 844.

	Tray	Capacity	Weight	Price, each
No. 10.	No. 13 Steel	350 lbs. Coal	112 lbs.	\$20 00
No. 12.	No. 15 Steel	3½ bu. Coke	100 lbs.	18 50



Packed for Shipment.



STEEL MINING CARS.

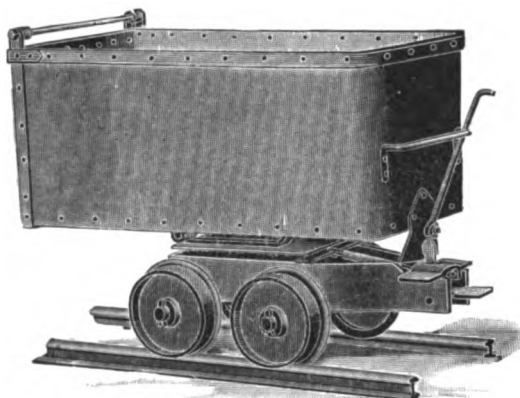
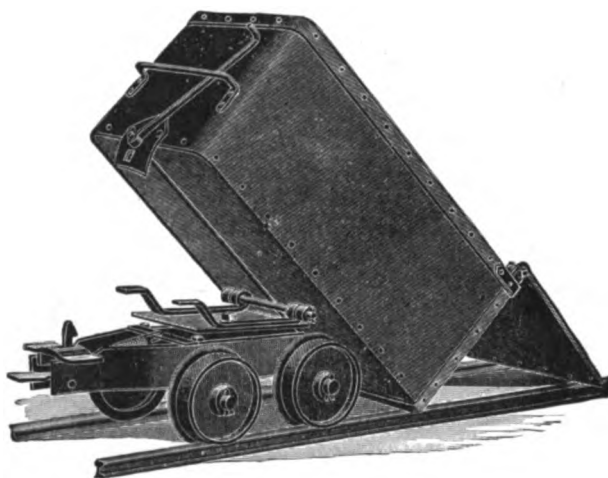


Plate 845.

CUT SHOWING CAR DUMPING AT END.



Great care is exercised in the construction of our Mining Cars, and the best possible results are obtained by a proper distribution of the weight. The Beds are made of the very best quality of sheet steel; Wheels are cast iron, supplied with Self-oiling, Dust-proof Caps, and all other parts are made of forged steel and iron. The Beds are so hinged that the load can be dumped at either side or end, as desired. Built to run on 18 to 24 inch track. In ordering, be careful to state the gauge of your track. We can build Cars of any required capacity or style, and estimates will be promptly furnished upon application. The following are standard sizes: No. 1, Bed 44 inches long, 24 inches wide, 21 inches deep; sides of Box made of No. 14 steel; Bottom and Door, No. 12 steel; Wheels, 10 inch diameter; Axles, $1\frac{1}{4}$ inch round; capacity, 12 cubic feet; weight, 380 pounds.

Price on application.

ROTARY DUMP STEEL CARS.

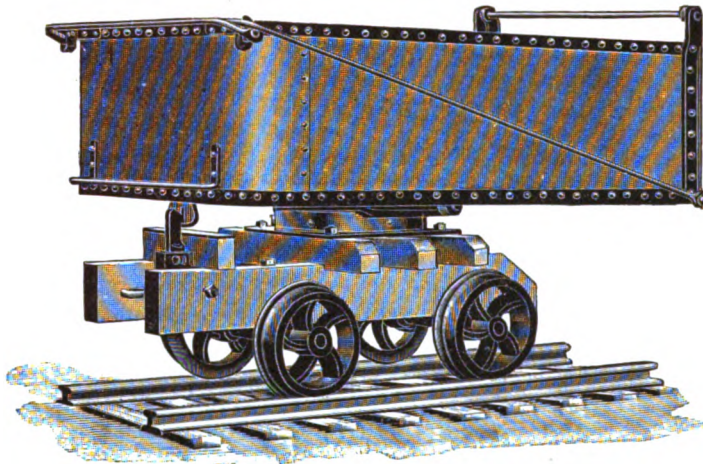
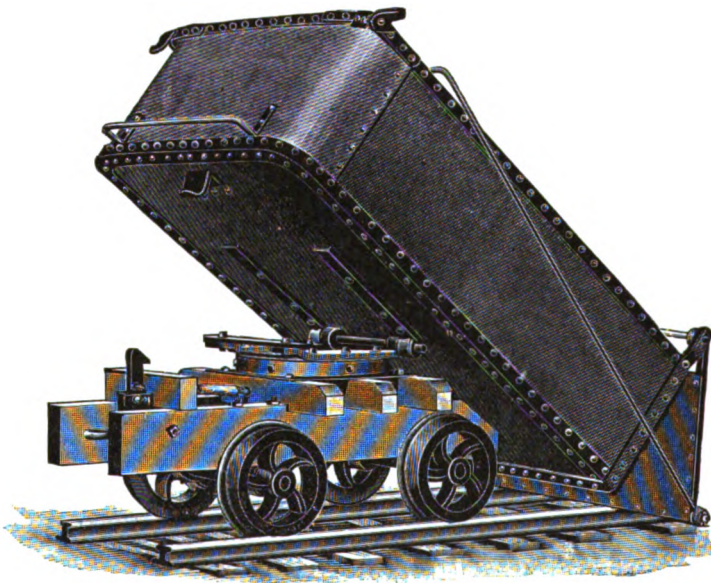


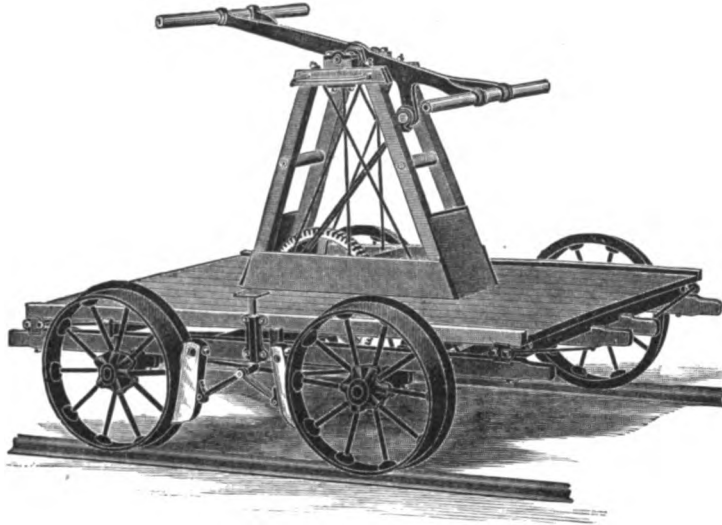
Plate 846.

CUT SHOWING CAR DUMPING AT END.



We make them with Box of any size or capacity desired. The Car here illustrated is of the following dimensions:

Box 72 inches long, 46 inches wide, 22 inches deep, of No. 8 U. S. Gauge Steel Plate; Steel Angles around bottom at front end and sides, 4 x 4 x 1/4 inches, and rivets 3/8 x 3/4 inch. The capacity of this size box is 42 cubic feet. This Car is made for track 23 inches gauge. We make any gauge desired. The End Gauge is hinged at top, and has an iron ball, secured at bottom, which extends diagonally to the opposite upper corners of box, and there engages with an eccentric-locking device, which holds the End Gate firmly in place until released for dumping. This Locking Device is our own design, very simple and automatic in action. After the load is dumped, the Box is brought back to a level position, when the End Gate will close automatically and lock itself, ready for reloading, as shown above. The Wheels are 14 inches diameter, shrunk solid on 2 inch round Steel Axles, which revolve in Cast Iron Bearing Boxes. Weight of this Car is 1,400 pounds. These Improved Cars are improved, in that they are made with our Improved Rotating Device, or Turntable. It consists of two steel plates, one of which rests upon the cross-sills of the Car, and the other attached to hinges on the bottom of the Box. Between these plates is a pair of Annular Rings, similar to a large Fifth Wheel in an ordinary wagon. Between the two Fifth Wheels are six Steel Rollers, 1 1/4 inch diameter, which are held in position by two Steel Rings—one of which is inside, and the other outside of the Fifth Wheel. In turning the Box of Car, the Rollers revolve and the Fifth Wheel turns easily upon them, preventing any friction, and the heaviest load is easily dumped on either side or end of Car. We are the exclusive manufacturers of Cars with Roller Bearing Rotating Device or Turntable, and such Cars are without question the easiest to operate, wear longer, and give better satisfaction in general than any other Cars. These Cars are provided, when so ordered, with Draw Bars, Coupling Links and Pins. When used for Sand, we make these Cars with Steel Broom Track Sweeping Attachment, at one or both ends, as desired. Prices on application.

STANDARD RAILWAY SECTION OR HAND CAR.**Plate 847.**

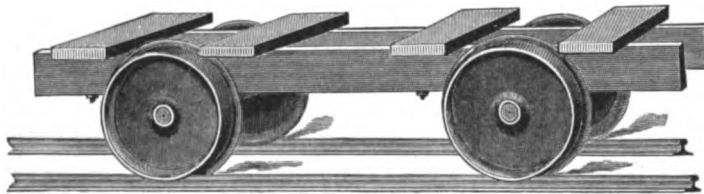
Very easy running. Strong, durable, light. This is the Standard Hand Car for section service on all leading lines of railways in this country. Platform, 6 feet long by 4 feet 4 inches wide, of best hard wood, well bolted together, and painted venetian red. Improved Adjustable Iron Walking Beam and no dead centre. Staggered Wrought Spoke Wheels, 20 inches diameter, keyed tight on Steel Axles $1\frac{1}{2}$ inches diameter, latter turning in Iron Boxes having Brass Bearings. Weight complete, 520 lbs.

Price \$70 00

YARD PUSH CARS.

FOR YARD TRACKS IN LARGE FACTORIES, LUMBER YARDS, ETC.

FOR LIGHT T TRACK, 30-INCH GAUGE.

**Plate 848.**

These Cars are well built, light and strong, and will carry a very heavy load. Designed principally for use on yard tracks in large factories, for handling lumber, iron or other material, conveying completed stock from shop to warehouse, etc. Sills, 7 feet long by $3\frac{1}{4}$ inches wide by $5\frac{1}{2}$ inches deep. Cross Pieces, $3\frac{1}{2}$ feet long by 2 inches thick by $6\frac{3}{4}$ inches wide. Steel Axle, $2\frac{1}{4}$ inches round. Axle Boxing, 4 x 9 inches, outside. Wheels, 16 inches in diameter, $4\frac{1}{2}$ inch face, $3\frac{3}{4}$ inch tread. These are best gray castings, and are shrunk on Axle. Height from track to top of Cross Pieces, 18 inches. Weight, 625 lbs.

Price on application.

RAILWAY PUSH CARS.

STANDARD GAUGE.

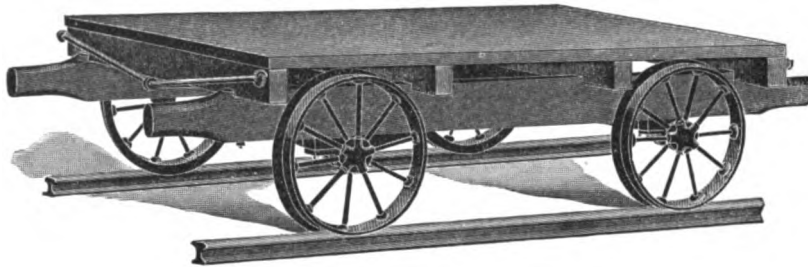


Plate 849.

Strong! Durable! Easy Running! This Car is designed for carrying Ties, Rails, and other material along the line of railways in course of construction, and for repair work on old roads. For track 4 feet 8½ inch gauge.

Platform of oak timber, 7 feet long by 5 feet 7½ inches wide. Two heavy sills that project as handles at ends, and four cross-sills, heavy in proportion. Trussed crosswise at both ends. All well bolted together.

Wheels, 20 inches diameter by 3½ inches tread on rail. The Wheels are made with cast-iron rim and hub and have steel spokes ⅞ inch round. Weight, 70 lbs. each.

The wood parts of car are painted metallic brown or venetian red, as preferred, and all metal parts black. Weight, 850 lbs. Price, \$35.00.

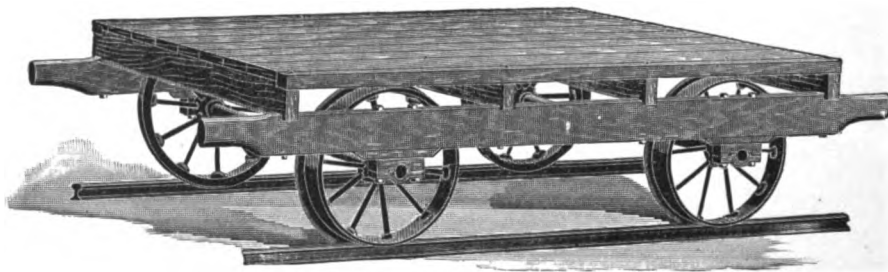
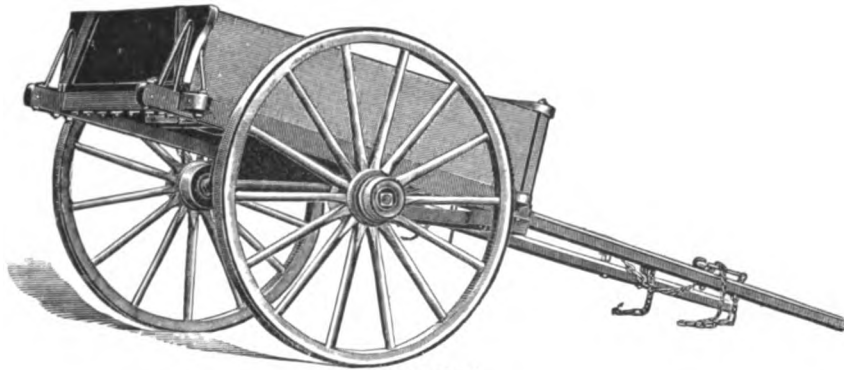


Plate 850.

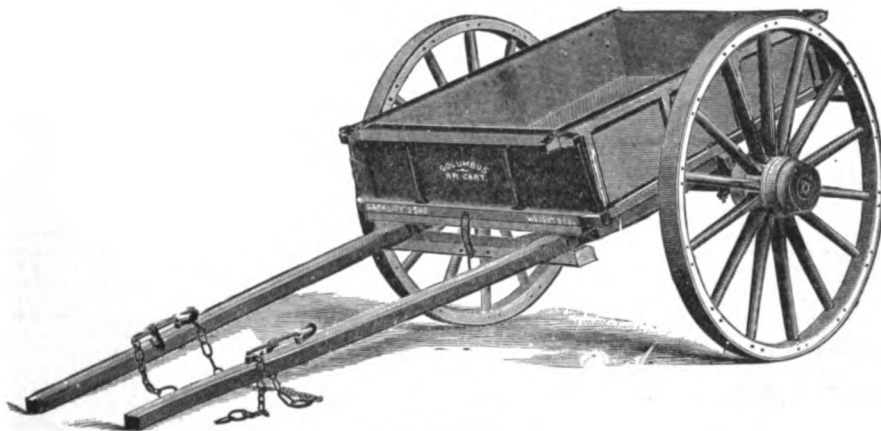
NARROW GAUGE CAR.

This is made as above described, except that the platform is only 5 feet in width, and the axle-bearings are outside of the wheels. Weight, 750 lbs. Price, \$30.00.

CONTRACTORS' ROCK CART.**Plate 851.**

Strong, substantial, durable. Made throughout of hardwood, strongly bolted and braced. Specially adapted for the hardest usage, in hauling rock, gravel, clay, and other heavy material. Parts easily replaced when worn out.

Bed, size of inside, 66 inches long, 44 inches wide, 14 inches deep; wheels, 54 inches diameter; hubs, 9 inches diameter, 12 inches long; spokes, fourteen $2\frac{1}{2}$ inch best second-growth oak; tires, $3 \times \frac{1}{2}$ inch; steel axle, $2\frac{1}{4}$ inches square; spindle $2\frac{1}{4} \times 10$ inches; wood axle bed, $3\frac{1}{4} \times 8$ inches; shafts, oak or ash, $2\frac{3}{4} \times 3\frac{1}{4}$ inches, with heavy cross-bar, $2\frac{1}{2} \times 8$ inches. Supplied with necessary chains and hooks as in cut. The bed has two heavy sills, $2\frac{3}{4} \times 4$ inches, with heavy cross-piece, $2\frac{3}{4} \times 3$ inches at rear end. The sides, ends and bottom are all $1\frac{3}{8}$ inches thick. The front end board has cross-piece on top, $1\frac{3}{4} \times 4$ inches, bolted down through the sills, and these bolts firmly bind together the front end of the bed. There are also four heavy anchor bolts inside on each side board, firmly securing them to the side sills, and the side boards have heavy iron straps along the upper edges. The rear ends of sides and the tail gate have heavy iron braces; the Cart is painted venetian red; the wheels are set to standard wide track, 5 feet 2 inches. Weight, 800 lbs. Capacity, 24 cubic feet.

COLUMBUS RAILROAD DUMP CART.**Plate 852.**

These Carts are especially adapted for contractors. Panel bed, made entirely of hard wood, well bolted together, ironed at rear end, and well braced.

Steel axle, $2\frac{1}{4}$ inches square; skein boxes, $2\frac{1}{4} \times 10$ inches; heavy wood hub wheels, 56 inches in diameter; tire, $3\frac{1}{2} \times \frac{1}{2}$ inches; hub, 10 inches diameter by 12 inches long; 14 spokes; dimensions of bed—length, 5 feet 6 inches; width, 3 feet 7 inches; depth—rear, 12 inches; front, 15 inches; all measurements are inside. The panel rails are $1\frac{3}{4} \times 2$ inches; bottom board, $1\frac{3}{4}$ inches thick; sides and ends, $\frac{3}{4}$ inch thick; the shafts are 6 feet 8 inches long and extra strong, being firmly braced and bolted together; they are hinged to axle bolster, which is 4×5 inches, by U bolts, and are quickly detached for shipment or storage. The tail gate has our own pattern latch or fastener, simple and easily operated. Our price includes all necessary chains and hooks, as shown in illustration. Painted steel blue, striped and varnished. Weight, 800 lbs. Capacity, 22 cubic feet, or 3,500 lbs.

MAMMOTH HARD-PAN RAILROAD PLOW.

FOR USE WITH HORSE OR STEAM POWER, FOR HEAVY WORK, HARD-PAN AND ROCK.

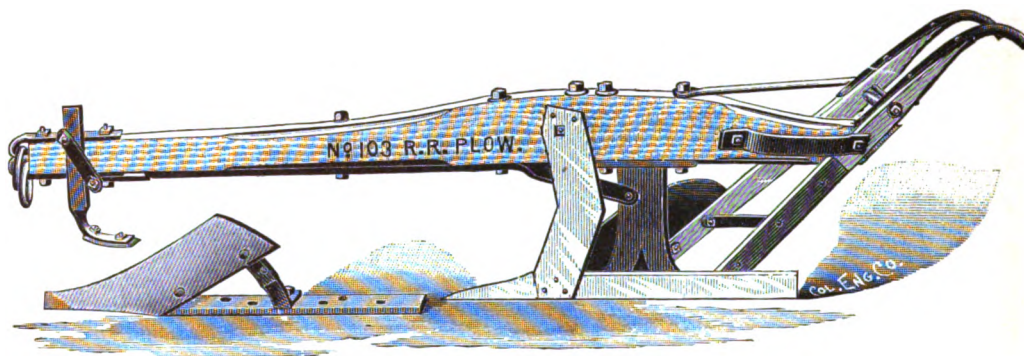


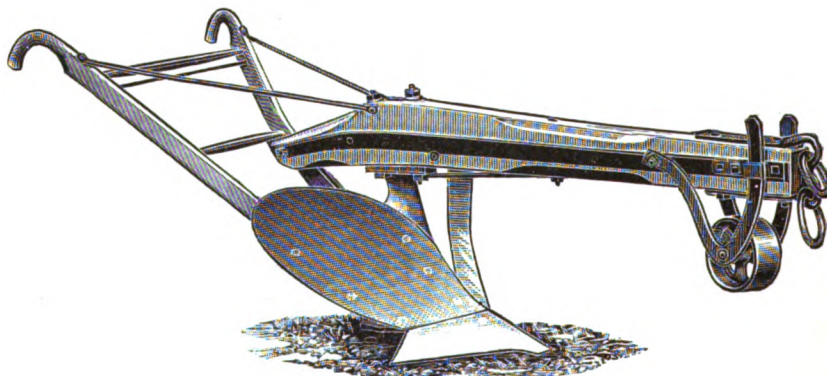
Plate 853.

It cuts a 9 inch furrow, 6 to 12 inches deep, and will plow anything. Beam very strong, 7 feet long and $3\frac{1}{2} \times 7$ inches at standard, heavy in proportion, and ironed heavily on top and sides. Draft rod, $2 \times \frac{3}{8}$ inches. Handles of oak, ironed on top and bottom with $1\frac{1}{4} \times \frac{1}{2}$ inch bars; also plated with iron on sides. Handhold solid iron and well braced. The standard, mould board and landside of cast steel of best quality, and point extra quality wrought steel, and very heavy. Extra points are charged extra. No. 2 left hand. No. 12 right hand. Weight, 325 lbs.

Price \$75 00

No. 3 OR 13 RAILROAD OR GRADING PLOWS.

IRON HAND-HOLD AND HANDLES IRONED.



SEE OUT BELOW.

Plate 854.

The beam is the toughest butt cut white oak, carefully selected: length, 7 feet, and $3\frac{1}{4} \times 7$ inches at standard. Handles braced. The standard is of wrought iron V shaped, secured to beam by two strong bolts, and will not twist or break. The strongest standard known. The point, landside, mould board, and coulter are of the very best wrought steel. It has an adjustable gauge wheel, $3 \times 6\frac{1}{2}$ inches. The beam is heavily ironed on both sides, with heavy iron strap underneath, extending from standard to clevis, and securely bolted to both. Now made with wrought iron clevis, having two strong rings, as shown in cut. The extra long handles give the holder perfect control. Owing to the peculiar shape of the mould board—our own patent—these Plows can be drawn easily by two horses, but are strong enough for six or eight, and they will scour where no other Plows will. This Plow is made to cut a deep rather than a wide furrow, and can be regulated to any depth required. It does not turn the soil over, but loosens it, leaving the trash on top, so that it will not interfere with the Scraper when filling. Extra points are charged extra. Also furnished with heavy steel gauge shoe, in place of gauge wheel (see cut below) when so ordered. No. 3 left hand. Weight, 200 lbs. No. 13 right hand. Weight, 200 lbs.

Price, for No. 3 or 13 \$30 00

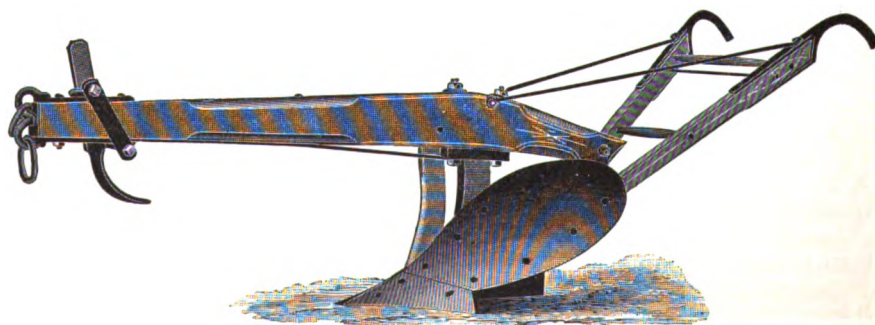


Plate 855.

SURFACE GRADER.

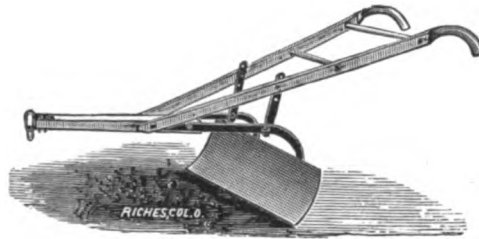


Plate 856.

This is intended for one horse only, and is used for removing the plowed ground from the sides of the road to the road-bed immediately opposite. It is worked by either backing the horse up to the place of filling or by crossing over from side to side, the driver retaining his load until the proper place is reached, or gradually losing it from beneath, as he may wish.

It is also of great service in grading and leveling off after the Scraper, leaving the road-bed level or rounded up, as desired. The beam is made of oak wood, and two substantial wrought iron standards, as shown in cut above. It is light, but strong and durable.

Steel blade, $\frac{1}{4}$ inch thick, 15 inches wide and 30 inches long. Weight, 60 lbs.

Price \$9 00

ROAD LEVELER.

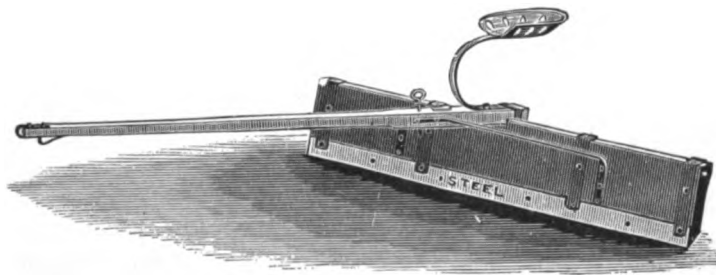


Plate 857.

For smoothing rough roads of any kind, dirt or gravel. Unsurpassed for use on turnpikes. It is largely used in the spring when the frost is first out of the ground, and before the regular road work is done. By merely driving once or twice over the roughest roads, the ridges are cut down, the ruts filled up, and the road-bed put in temporary good order. It will pay for its cost in one day's use.

Steel Blade, $\frac{1}{4}$ inch thick by 4 x 72 inches and Stamped Steel Seat. Weight, 150 lbs.

Price \$12 00

THE MOHAWK SOLID STEEL DRAG SCRAPER.

SCRAPER WITHOUT RUNNERS.

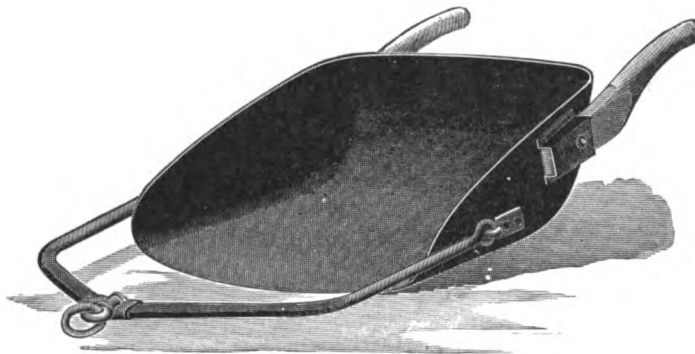


Plate 858.

SCRAPER WITH RUNNERS.

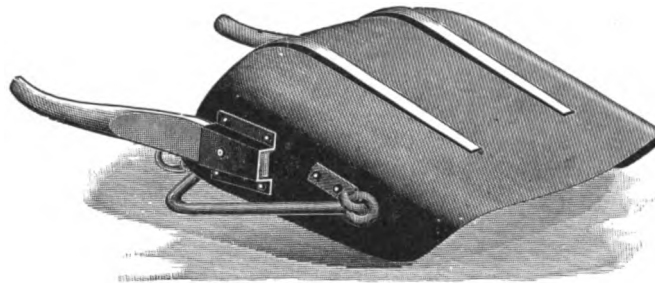
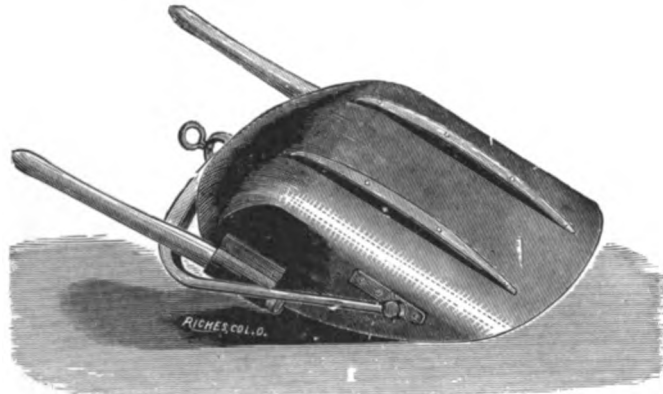


Plate 859.

Best and cheapest Scraper in the market.

These Scrapers are made from heavy plates, of specially hardened steel, and are stamped from one sheet without joint, seam or rivet. They are superior to any other Drag Scraper upon the market, the Columbus Solid Steel Scraper alone excepted. The bowl being made of thicker and harder steel, enables it to scour where no other scraper will; and owing to the sharp, rounded nose, it will enter the ground more readily than any other make of Scraper. The Bails are Steel, with perfect working Swivels, and Handles of hard wood. We will guarantee this Scraper in every particular. Made in three sizes.

No. 1. Capacity, 7 cubic feet, each	\$10 00
No. 2. Capacity, 5 cubic feet, each	9 00
No. 3. Capacity, 3½ cubic feet, each	8 00
With Steel Runners, each extra	1 00
With Steel Bottom Plate, each extra	1 50

COLUMBUS SOLID STEEL SCRAPERS.**SCRAPER WITHOUT RUNNERS.****Plate 860.****SCRAPER WITH RUNNERS.****Plate 861.**

Improved in that we now make the Scraper longer and deeper, so that while it carries more earth, at the same time it runs much easier, and has more wearing surface. The perfect Scraper, made of a single sheet of steel, pressed into the best and most practicable shape for working. It is made with one continuous curve from the center up the sides and back, giving it greater strength and capacity than can be obtained in any other way. It is without joint or seam, and there is not a sharp corner, angle, bolt, brace or stay-rod about the Scraper. It will work in any kind of soil, whether plowed or not, and enters the ground as readily as a plow. We guarantee it to fill easier and clean better than any other Scraper, and it will scour where no other Scraper will. It is not injured by exposure to the weather, and there is nothing about it to get out of repair. Suits any climate. The handles will commend themselves to every one, as they can, if broken, be easily replaced anywhere. Bails of steel, and of improved pattern, with strong and perfect working swivels. The best bails ever put on Scrapers. The entire bowl of the Scraper is made of one sheet of heavy steel, and is the only one so made. All other Scrapers represented as made of one sheet of steel have the old wood back, with sharp corners and stay-rods, bolts and braces, which are constantly getting out of repair, or riveted backs, which are worse. It is the lightest, strongest, and most durable, and will displace all others wherever it is known.

No. 1 carries 7 feet of earth	\$15 00
No. 2 carries 5 feet of earth	14 00
No. 3 carries 3 feet of earth	13 00
With Runners, extra, per Scraper.	1 00
With Steel Bottom Plate, extra, per Scraper	1 50

THE K. & J. No. 1 PRESSED BOWL WHEEL SCRAPER.

WITH K. & J. IMPROVED WHEELS.

PRESSED BOWL SCRAPER IN CARRYING POSITION.

(Patented November 4, 1879; September 8, 1885; October 5, 1886.)

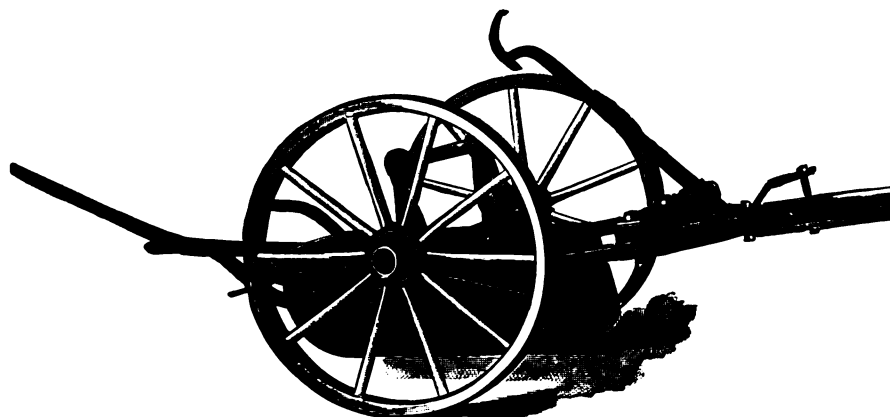


Plate 862.

WITH END GATE IN CARRYING POSITION.

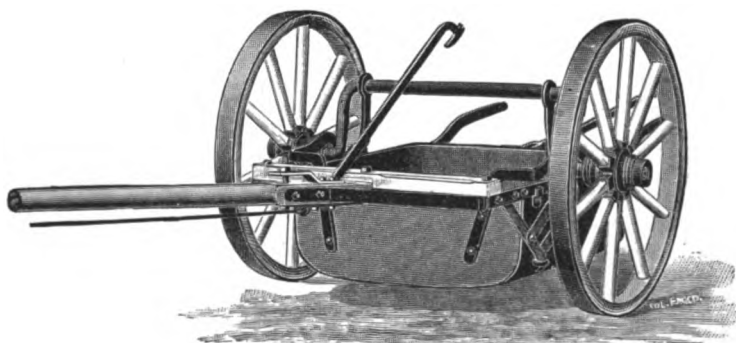


Plate 863.

This Wheel Scraper has our new Patent Automatic Lock Hooks, independent Steel Axle, Bifurcated Compound Lever, Steel Bowl and Improved K. & J. Iron Hub Wheels.

It is built after the model of the celebrated K. & J. Contractors' Wheel Scrapers, and we will guarantee it to be not only stronger and more durable than any other Wheelers manufactured, but also much easier for both man and team in operating.

This Improved Scraper is so constructed that it does away with all of the objectionable features of other Wheelers, and cannot fail to give entire satisfaction.

DESCRIPTION—The Bowl, which is the hardest and best steel, is 34 inches long by 34 inches wide by 11½ inches deep. Capacity, 9 cubic feet level full, but will carry an average load of 10 cubic feet. Gauge of track, 4 feet 2 inches. We furnish either Pressed Bowls or Square Boxes, as ordered. Square Bowl Scraper weighs 300 lbs. Pressed Bowl Scraper weighs 381 lbs. K. & J. Heavy Hardened Iron Hub Wheels, 34 inches in diameter; tire, 3 inches wide.

N. B.—We do not furnish End Gates, Neck Yokes, or Whiffletrees unless especially ordered, and they are charged extra.

No. 1, K. & J., with Pressed Bowl	\$45 00
No. 1, K. & J., with Square Bowl	42 00

THE NEW K. & J. SQUARE BOX WHEEL SCRAPERS.

WITH SARVEN PATENT WHEELS.

IN CARRYING POSITION.

(Patented September 8, 1885, and October 5, 1886.)

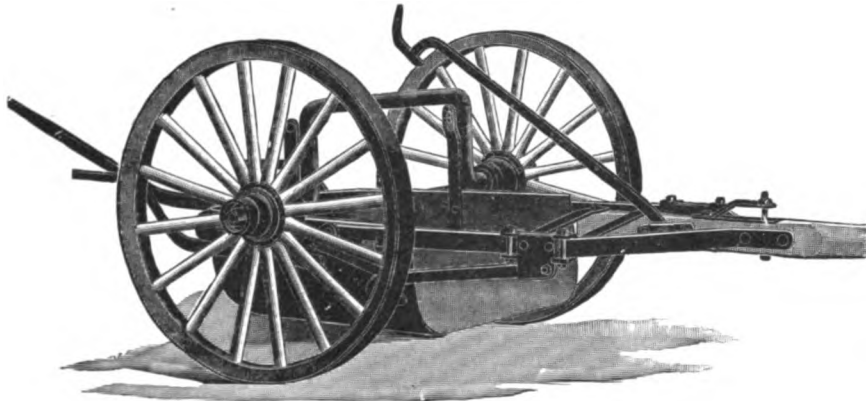


Plate 864.

The bowl, or box, is made of the best steel plate, $\frac{3}{8}$ of an inch thick. The Axle, Tongue Braces or Bail, Cross-Truss, Lever and Hangers are all of the best steel. These Scrapers have no castings to break, no rackets to clog up, and fewer nuts to come off, and parts to get out of order, than any other Wheel Scraper. They are so constructed that the team does most of the lifting, and one man can fill, raise and dump the largest size with ease. They are so hung that there is absolutely no strain whatever on the horses' necks.

No. 2. Capacity, 12 cubic feet. With Sarven Patent or Improved K. & J. wood wheels, 40 inches diameter; tire, $3\frac{1}{2} \times \frac{1}{4}$ inches; size of box—length, 36 inches; width, 38 inches; depth, $13\frac{1}{2}$ inches—all inside measurement; gauge of track, 4 feet 7 inches. Weight, 605 lbs.

Price \$50 00

No. 3. Capacity, 16 cubic feet. With Sarven Patent or Improved K. & J. wood wheels, 46 inches diameter; tire, $3\frac{1}{2} \times \frac{1}{4}$ inches; size of box—length, 42 inches; width, 42 inches; depth, 16 inches—all inside measurement; gauge of track, 5 feet 2 inches. Weight, 755 lbs.

Price \$55 00

No. 3 has Draft-Rod for Snatch-team.

AUTOMATIC FRONT END GATE.

FOR K. & J. WHEEL SCRAPERS ONLY.



Plate 865.

This Attachment is highly recommended by contractors wherever used. This is the only End Gate Attachment ever successfully applied to Wheel Scrapers. It is automatic in action, simple in construction, cannot get out of order, and can be easily attached or detached in two minutes. The end Gate is bolted to the uprights or hangers on side of Scraper with two bolts. In ordering Wheel Scrapers, please state whether they are wanted with or without End Gates. The price is \$5.00 extra. When Scraper is lowered to fill, the Axle-arms raise the End Gate up, and when Scraper is loaded and lifted into carrying position, the Gate falls with its own weight, closing the front of Scraper, and thus preventing the contents of bowl from sliding out. When Scrapers are working on long or down hill hauls, or in gravelly or buckshot material, it will save from three to four feet every load.

THE NEW K. & J. PRESSED BOWL WHEEL SCRAPERS.
WITH SARVEN PATENT WHEELS.
IN CARRYING POSITION.

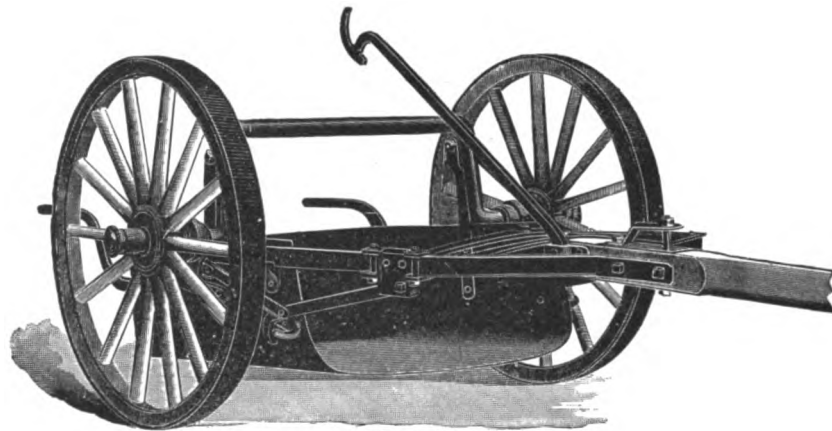


Plate 866.

ON THE ROAD.

(Patented November 4, 1879, September 8, 1885, and October 5, 1886.)

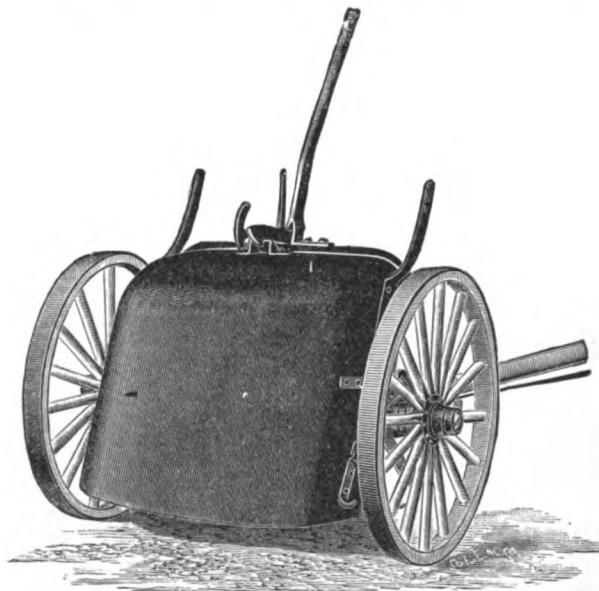


Plate 867.

The bottoms of all pressed bowl Scrapers are oil tempered. The largest sized Scraper, capacity, 17 cubic feet, is easily operated by one man. No strain on horses' necks.

No. 2. Capacity, 13 cubic feet; wheels, 40 inches in diameter; tire, $3\frac{1}{2} \times \frac{1}{4}$ inches; size of bowl—length, 36 inches; width, 38 inches; depth, 14 inches; all inside measurement; tracks, 4 feet, 7 inches. Weight, 600 lbs.

Price \$55 00

No. 3. Capacity, 17 cubic feet; wheels, 46 inches in diameter; tire, $3\frac{1}{2} \times \frac{1}{4}$ inches; size of bowl—length, 42 inches; width, 42 inches; depth, 16 inches; all inside measurement; tracks, 5 feet 2 inches. Weight, 744 lbs.

Price \$60 00

No. 3 has Draft-Rod. No. 2 sent with Draft-Rod only when specially ordered. The Sarven Patent Wood Wheels used on these Scrapers are much superior to the old style wooden hub wheels with which other wheel scrapers are made, being more durable and running easier. Whiffletrees and Neck-yokes are never furnished with Wheel Scrapers, unless specially ordered, and are always charged extra.

MUNSON'S LEATHER BELTING.**EAGLE BRAND—OAK TANNED.**

L.M.R.MFG. Co.

Plate 868.**SINGLE LIST.**

	Per foot.		Per foot.
1 inch	\$ 0 12	16 inch	\$ 2 60
1¼ inch	16	17 inch	2 80
1½ inch	20	18 inch	3 00
1¾ inch	24	19 inch	3 20
2 inch	28	20 inch	3 40
2¼ inch	32	21 inch	3 60
2½ inch	36	22 inch	3 80
2¾ inch	40	24 inch	4 20
3 inch	44	25 inch	4 40
3¼ inch	48	26 inch	4 60
3½ inch	52	27 inch	4 80
3¾ inch	56	28 inch	5 00
4 inch	60	30 inch	5 50
4½ inch	68	32 inch	6 00
5 inch	76	34 inch	6 50
5½ inch	84	36 inch	7 00
6 inch	92	40 inch	7 80
6½ inch	1 00	44 inch	8 60
7 inch	1 08	48 inch	9 40
8 inch	1 24	50 inch	9 80
9 inch	1 40	52 inch	10 20
10 inch	1 56	56 inch	11 00
11 inch	1 72	60 inch	11 80
12 inch	1 88	64 inch	12 60
13 inch	2 04	68 inch	13 40
14 inch	2 20	72 inch	14 40
15 inch	2 40		

DOUBLE LIST.

	Per foot.		Per foot.
1 inch	\$ 0 24	16 inch	\$ 5 20
1¼ inch	32	17 inch	5 60
1½ inch	40	18 inch	6 00
1¾ inch	48	19 inch	6 40
2 inch	56	20 inch	6 80
2¼ inch	64	21 inch	7 20
2½ inch	72	22 inch	7 60
2¾ inch	80	24 inch	8 40
3 inch	88	25 inch	8 80
3¼ inch	96	26 inch	9 20
3½ inch	1 04	27 inch	9 60
3¾ inch	1 12	28 inch	10 00
4 inch	1 20	30 inch	11 00
4½ inch	1 36	32 inch	12 00
5 inch	1 52	34 inch	13 00
5½ inch	1 68	36 inch	14 00
6 inch	1 84	40 inch	15 60
6½ inch	2 00	44 inch	17 20
7 inch	2 16	48 inch	18 80
8 inch	2 48	50 inch	19 60
9 inch	2 80	52 inch	20 40
10 inch	3 12	56 inch	22 00
11 inch	3 44	60 inch	23 60
12 inch	3 76	64 inch	25 20
13 inch	4 08	68 inch	26 80
14 inch	4 40	72 inch	28 80
15 inch	4 80		

Light Double Belts one and one-half price.

ROUND TWIST BELTING.

⅛ inch, per foot	\$0 06	½ inch, per foot	\$0 30
⅙ inch, per foot	10	⅝ inch, per foot	36
¼ inch, per foot	14	¾ inch, per foot	46
⅓ inch, per foot	18	⅞ inch, per foot	60
⅔ inch, per foot	22	1 inch, per foot	72

TANNED LACE LEATHER.

Per square foot \$0 30

TANNED CUT LEATHER LACING.

¼ inch, per 100 feet	\$1 00	⅝ inch, per 100 feet	\$ 2 75
⅓ inch, per 100 feet	1 50	¾ inch, per 100 feet	3 25
½ inch, per 100 feet	2 00		

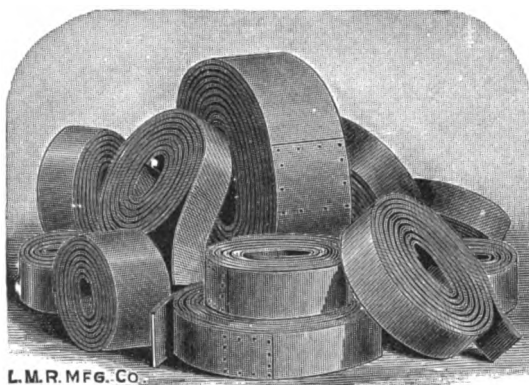
RAWHIDE SIDE LACE LEATHER.

Per square foot \$0 30

RAWHIDE CUT LACING.

¼ inch, per 100 feet	\$ 1 00	½ inch, per 100 feet	\$2 30
⅓ inch, per 100 feet	1 35	⅝ inch, per 100 feet	2 90
½ inch, per 100 feet	1 65	¾ inch, per 100 feet	3 50

RAW HIDE LEATHER BELTING.



L.M.R.MFG.Co.

Plate 889.

SINGLE LIST.

	Per foot		Per foot		Per foot
1 inch	\$0 12	7 inch	1 08	26 inch	\$ 4 60
1¼ inch	16	8 inch	1 24	27 inch	4 80
1½ inch	20	9 inch	1 40	28 inch	5 00
1¾ inch	24	10 inch	1 56	30 inch	5 50
2 inch	28	11 inch	1 72	32 inch	6 00
2¼ inch	32	12 inch	1 88	34 inch	6 50
2½ inch	36	13 inch	2 04	36 inch	7 00
2¾ inch	40	14 inch	2 20	40 inch	7 80
3 inch	44	15 inch	2 40	44 inch	8 60
3¼ inch	48	16 inch	2 60	48 inch	9 40
3½ inch	52	17 inch	2 80	50 inch	9 80
3¾ inch	56	18 inch	3 00	52 inch	10 20
4 inch	60	19 inch	3 20	56 inch	11 00
4½ inch	68	20 inch	3 40	60 inch	11 80
5 inch	76	21 inch	3 60	64 inch	12 60
5½ inch	84	22 inch	3 80	68 inch	13 40
6 inch	92	24 inch	4 20	72 inch	14 40
6½ inch	1 00	25 inch	4 40		

DOUBLE LIST.

	Per foot		Per foot		Per foot
1 inch	\$0 24	7 inch	\$2 16	26 inch	\$ 9 20
1¼ inch	32	8 inch	2 48	27 inch	9 60
1½ inch	40	9 inch	2 80	28 inch	10 00
1¾ inch	48	10 inch	3 12	30 inch	11 00
2 inch	56	11 inch	3 44	32 inch	12 00
2¼ inch	64	12 inch	3 76	34 inch	13 00
2½ inch	72	13 inch	4 08	36 inch	14 00
2¾ inch	80	14 inch	4 40	40 inch	15 60
3 inch	88	15 inch	4 80	44 inch	17 20
3¼ inch	96	16 inch	5 20	48 inch	18 80
3½ inch	1 04	17 inch	5 60	50 inch	19 60
3¾ inch	1 12	18 inch	6 00	52 inch	20 40
4 inch	1 20	19 inch	6 40	56 inch	22 00
4½ inch	1 36	20 inch	6 80	60 inch	23 60
5 inch	1 52	21 inch	7 20	64 inch	25 20
5½ inch	1 68	22 inch	7 60	68 inch	26 80
6 inch	1 84	24 inch	8 40	72 inch	28 80
6½ inch	2 00	25 inch	8 80		

GENUINE GANDY BELT.

This prepared Cotton Gandy Belting is used to advantage where rubber belting would last but a short time. It is impervious to water, and therefore makes the best threshing belt on the market. We keep the threshing belts 6 inch, 4-ply, in lengths of 120, 130 and 150 feet in stock, also 7 inch, 4-ply.

**Plate 870.**

FOUR-PLY.		SIX-PLY.		EIGHT-PLY.		TEN-PLY.	
Inch	Per ft.	Inch	Per ft.	Inch	Per ft.	Inch	Per ft.
1½	\$0 13½	3	\$0 36	6	\$0 90	12	\$ 2 40
1¾	15¾	3½	42	7	1 05	14	2 80
2	18	4	48	8	1 20	15	3 00
2¼	20¼	4½	54	9	1 35	16	3 20
2½	22½	5	60	10	1 50	18	3 60
2¾	24¾	6	72	11	1 65	20	4 00
3	27	7	84	12	1 80	22	4 40
3½	31½	8	96	14	2 10	24	4 80
4	36	9	1 08	15	2 25	26	5 20
5	45	10	1 20	16	2 40	28	5 60
6	54	12	1 44	17	2 55	30	6 00
7	63	13	1 56	18	2 70	36	7 20
8	72	14	1 68	20	3 00	40	8 00
9	81	15	1 80	24	3 60	44	8 80
10	90	16	1 92	30	4 50	48	9 60
11	99	17	2 04	36	5 40	54	10 80
12	1 08	18	2 16	40	6 00	60	12 00

SOLID WHITE COTTON BELTING.

TWO-PLY.			
Inch	Per ft.	Inch	Per ft.
1	\$0 04	5	\$0 13
1½	05	6	17
2	06	7	19
2½	06½	8	21
3	07	9	23
3½	08	10	26
4	09	12	33

THREE-PLY.			
Inch	Per ft.	Inch	Per ft.
1½	\$0 08	5	\$0 19
2	08	6	23
2½	10	7	27
3	12	8	31
3½	14	9	35
4	15	10	39
4½	17	12	48

**Plate 871.**

FOUR-PLY.			
Inch	Per ft.	Inch	Per ft.
2	\$0 12	4½	\$0 24
2½	14	5	26
3	16	6	30
3½	18	7	34
4	21	8	38

FIVE-PLY.			
Inch	Per ft.	Inch	Per ft.
10	\$0 63	16	\$1 12
12	75	18	1 28
14	94	20	1 44

SIX-PLY.			
Inch	Per ft.	Inch	Per ft.
10	\$0 75	16	\$1 35
12	90	18	1 50
14	1 12	20	1 72

Any width made to order.

NEW YORK RUBBER CO.'S RUBBER BELTING.

L. M. RUMSEY MANUFACTURING CO., GENERAL WESTERN AGENTS.

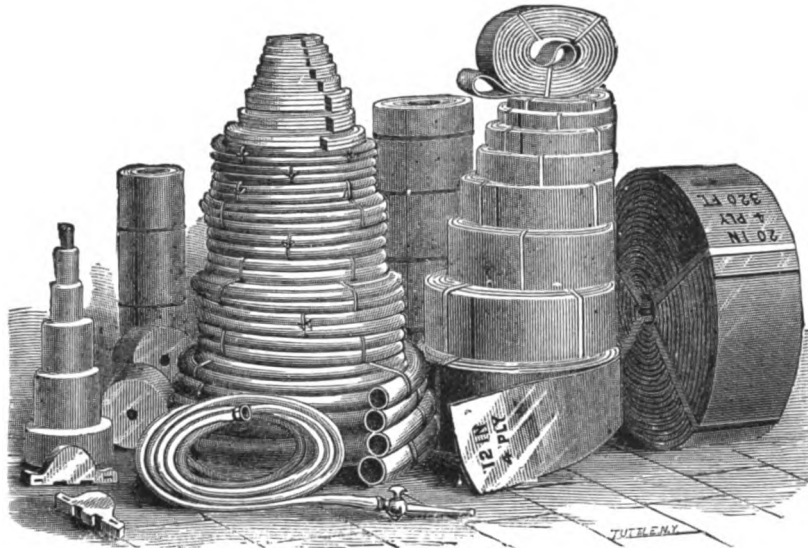
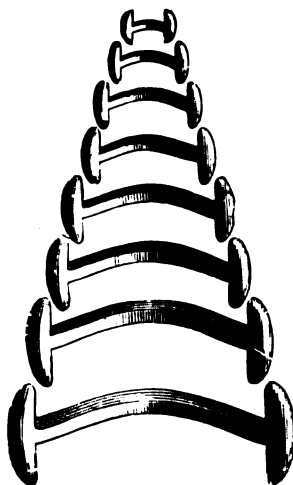


Plate 872.

PRICES PER FOOT.

Width	2-Ply	3-Ply	4-Ply	5-Ply	6-Ply
1 inch	\$0 07	.....	.....	.....	.....
1 1/4 inch	09	.....	.....	.....	.....
1 1/2 inch	11	13	19	.....	.....
2 inch	15	17	21	.....	.....
2 1/2 inch	18	22	26	.....	.....
3 inch	22	26	31	.....	.....
3 1/2 inch	26	30	37	.....	.....
4 inch	30	34	42	.....	.....
4 1/2 inch	33	39	47	.....	.....
5 inch	36	43	52	.....	.....
6 inch	43	52	62	78	.....
7 inch	51	60	73	91	.....
8 inch	59	70	84	1 05	1 26
9 inch	67	80	95	1 18	1 42
10 inch	75	90	1 07	1 33	1 60
11 inch	83	1 00	1 18	1 47	1 77
12 inch	91	1 08	1 30	1 62	1 95
13 inch	1 00	1 18	1 42	1 77	2 13
14 inch	1 08	1 28	1 54	1 92	2 31
15 inch	1 16	1 38	1 66	2 07	2 49
16 inch	1 25	1 50	1 78	2 22	2 67
18 inch	1 41	1 70	2 02	2 52	3 03
20 inch	1 58	1 90	2 26	2 82	3 39
22 inch	1 76	2 12	2 52	3 15	3 78
24 inch	1 96	2 36	2 80	3 50	4 20
26 inch . . . . .	.....	2 60	3 08	3 85	4 62
28 inch . . . . .	.....	2 84	3 36	4 20	5 04
30 inch . . . . .	.....	3 10	3 64	4 55	5 46
32 inch . . . . .	.....	.....	3 92	4 90	5 88
34 inch . . . . .	.....	.....	4 20	5 25	6 30
36 inch . . . . .	.....	.....	4 48	5 60	6 72
38 inch . . . . .	.....	.....	4 76	5 95	7 14
40 inch . . . . .	.....	.....	5 04	6 30	7 56
42 inch . . . . .	.....	.....	5 32	6 65	7 98
44 inch . . . . .	.....	.....	5 60	7 00	8 40
46 inch . . . . .	.....	.....	5 88	7 35	8 82
48 inch . . . . .	.....	.....	6 16	7 70	9 24

BLAKE'S BELT STUDS.**Plate 873.**

No. 5, For all sizes below 6 inch Belting, per 100	\$0 70
No. 4, For all sizes below 6 inch Belting, per 100	80
No. 3, For all sizes below 6 inch Belting, per 100	90
No. 2, For all sizes above 6 inch Belting, per 100	1 25
No. 1, For all sizes above 6 inch Belting, per 100	1 65
No. 0, For Double Belts, or 5 and 6-Ply Rubber Belts, per 100	2 00
No. 00, For Double Belts, or 5 and 6-Ply Rubber Belts, per 100	2 50

Large Cutters, \$1.25; Small Cutters, \$0.90. Awls to spread and split, \$0.25.

The Slits for these Studs should be $\frac{1}{4}$ inch from the ends of the Belt and $\frac{1}{4}$ inch apart.

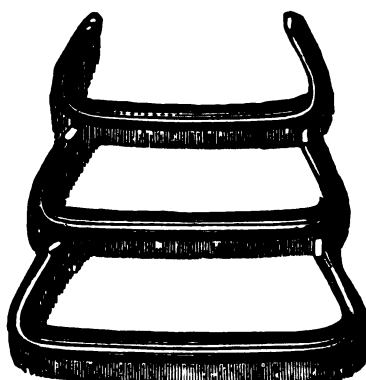
THE BUFFALO BELT FASTENERS.

SIMPLE. PRACTICAL, CHEAP.

**Plate 874.**

Although our object in presenting this Fastener is to introduce an article that can be applied without the aid of one or more tools, which usually are more expensive than the Fasteners themselves, and useless for any other purpose, we feel confident that in recommending plyers, we recommend a tool found in almost every workshop, and one that can be used for a thousand other purposes. The reader will also see that the Fasteners can be applied without even the aid of plyers.

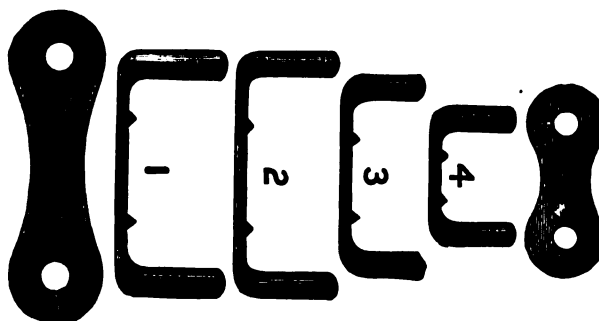
	Per 1,000		Per 1,000
No. 15, 1,000 in a Box	\$1 50	No. 8, 500 in a Box	\$3 50
No. 13, 1,000 in a Box	2 00	No. 7, 250 in a Box	4 00
No. 10, 1,000 in a Box	2 50	No. 6, 250 in a Box	5 00

POINTED BELT HOOKS.**Plate 875.**

3 inch, per 100	\$6 00	No. 8, per 100	\$0 50
2½ inch, per 100	5 00	No. 9, per 100	40
No. 1, per 100	3 00	No. 10, per 100	35
No. 2, per 100	2 00	No. 11, per 100	30
No. 3, per 100	1 60	No. 12, per 100	28
No. 4, per 100	1 40	No. 13, per 100	26
No. 5, per 100	1 10	No. 14, per 100	24
No. 6, per 100	85	No. 15, per 100	20
No. 7, per 100	60		

COPPER RIVETS AND BURS.**Plate 876.**

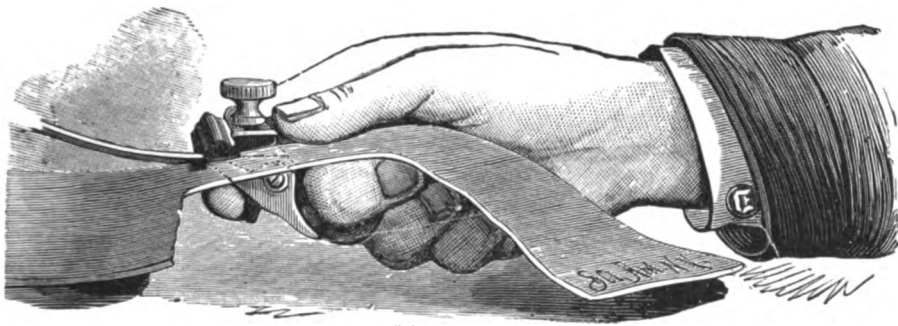
No. 7, Copper Rivets and Burs, per pound	\$0 49
No. 8, Copper Rivets and Burs, per pound	50
No. 9, Copper Rivets and Burs, per pound	52
No. 10, Copper Rivets and Burs, per pound	54
No. 12, Copper Rivets and Burs, per pound	58

SMITH'S BELT FASTENERS.**Plate 877.**

These Fasteners are warranted to run successfully upon any Belt if directions are followed.

Packed 100 in a box.

Number	1	2	3	4
Per 100	\$2 00	1 75	1 50	1 25
Combination Punch, each				\$1 25

NONPAREIL LACE CUTTER.**Plate 878.**

Price, each \$0 50

BELT AWL.**Plate 879.**

Push the Awl through the Belt from either side as required, until first or second hole (whichever the size of the lace used may require) of Awl is visible on the opposite side of the Belt. Put end of lace through the hole in the Awl, pull Awl back, and lacing will come with it every time. Turning or twisting Awl to the right it will cut hole, but turned to the left, it only swells it without cutting.

Price, per doz. \$9 00

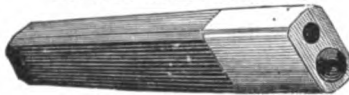
ROUND BELT PUNCH.**Plate 880.**

Number	1	2	3	4	5	6	7	8	9	10
Size Wire Gauge, No. .	12	11	10	9	8	7	6	5	4	3
Price, each	\$0 15	15	15	20	25	28	30	35	40	45

No. 6 Punch is right size for No. 7 Copper Rivet. No. 5 for No. 8 Rivet. No. 4 for No. 9 Rivet.

RIVET SET AND HEADER.

EXTRA CAST STEEL.

**Plate 881.**

Number	00 and 0	1 and 2	3 and 4	5 and 6	7 and 8
Per doz.	\$9 00	7 50	6 00	4 50	3 75

No. 2 is right size for Copper Rivet No. 9. No. 3 is right size for Copper Rivet No. 7.
No. 4 is right size for Copper Rivet No. 8.

ROUND BELT COUPLING.

CAST STEEL.

**Plate 882.**

Size	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$ in.
Per doz.	\$2 00	2 00	2 00	2 50	3 00	3 50	4 00	5 00	6 00	9 00	13 00	18 00	22 00

RUBBER HOSE.

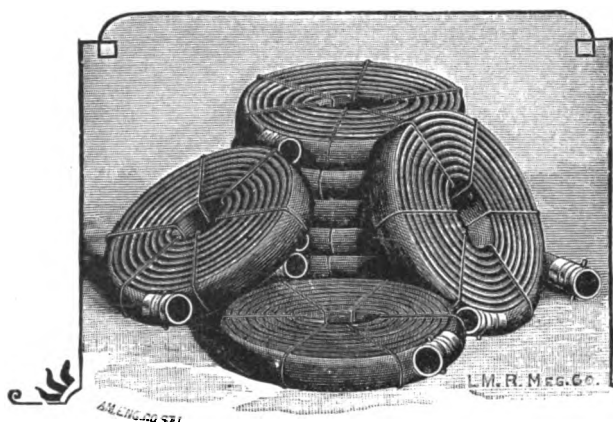


Plate 883.

The sizes indicated in the list are the inner diameters. It is furnished in lengths of fifty feet, and these we do not cut, but make to order any lengths less than fifty feet, of any size or strength required.

TWO-PLY HOSE.

This Hose is not calculated to stand much pressure, and is designed for conducting fluids.

	Per foot		Per foot
$\frac{1}{2}$ in . . .	\$0 20	$2\frac{1}{4}$ in . . .	\$0 75
$\frac{3}{4}$ in . . .	25	$2\frac{1}{2}$ in . . .	83
1 in . . .	33	$2\frac{3}{4}$ in . . .	92
$1\frac{1}{4}$ in . . .	42	3 in . . .	99
$1\frac{1}{2}$ in . . .	50	$3\frac{1}{2}$ in . . .	1 16
2 in . . .	66	4 in . . .	1 32

THREE-PLY HOSE.

This Hose is made to stand a pressure of 100 pounds to the square inch, and is suitable for Hydrants, Force Pumps, etc.

	Per foot		Per foot		Per foot		Per foot
$\frac{1}{2}$ in	\$0 25	$1\frac{1}{4}$ in	\$0 50	$2\frac{1}{4}$ in	\$0 90	3 in	\$1 20
$\frac{3}{4}$ in	30	$1\frac{1}{2}$ in	60	$2\frac{1}{2}$ in	1 00	$3\frac{1}{2}$ in	1 40
1 in	40	2 in	80	$2\frac{3}{4}$ in	1 10	4 in	1 60

FOUR-PLY HOSE.

The Four-ply Hose is designed for leading Hose for hand fire engines and other purposes where the pressure is not greater than 150 pounds to the square inch.

	Per foot		Per foot		Per foot		Per foot
$\frac{1}{2}$ in	\$0 30	$1\frac{1}{4}$ in	\$0 62	$2\frac{1}{4}$ in	\$1 12	3 in	\$1 50
$\frac{3}{4}$ in	37	$1\frac{1}{2}$ in	75	$2\frac{1}{2}$ in	1 25	$3\frac{1}{2}$ in	1 75
1 in	50	2 in	1 00	$2\frac{3}{4}$ in	1 37	4 in	2 00

Five or Six-ply Hose made to order at an advance of 25 and 50 per cent., respectively on prices of four-ply.

BREWERS' FOUR-PLY HOSE.

	Per foot		Per foot		Per foot
$\frac{3}{4}$ in	\$0 67	$1\frac{1}{4}$ in	\$1 04	$1\frac{3}{4}$ in	\$1 45
1 in	83	$1\frac{1}{2}$ in	1 25	2 in	1 66

RUBBER FIRE HOSE.

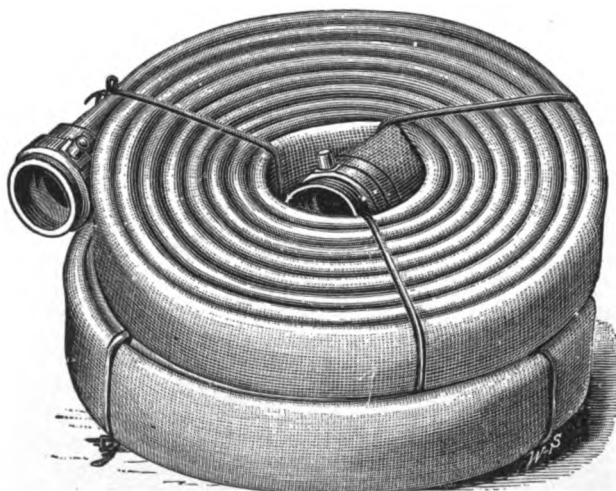


Plate 884.

2 in	4-ply, with 5-ply end, Mohawk Fire Hose, best, per foot	\$1 50
2 in	5-ply, with 6-ply end, Mohawk Fire Hose, best, per foot	2 00
$2\frac{1}{2}$ in	4-ply, with 5-ply end, Mohawk Fire Hose, best, per foot	2 25
$2\frac{1}{2}$ in	5-ply, with 6-ply end, Mohawk Fire Hose, best, per foot	2 50
$2\frac{1}{2}$ in	6-ply, with 7-ply end, Mohawk Fire Hose, best, per foot	3 00

These prices include couplings fitted to hose. A liberal discount from above prices furnished on application.

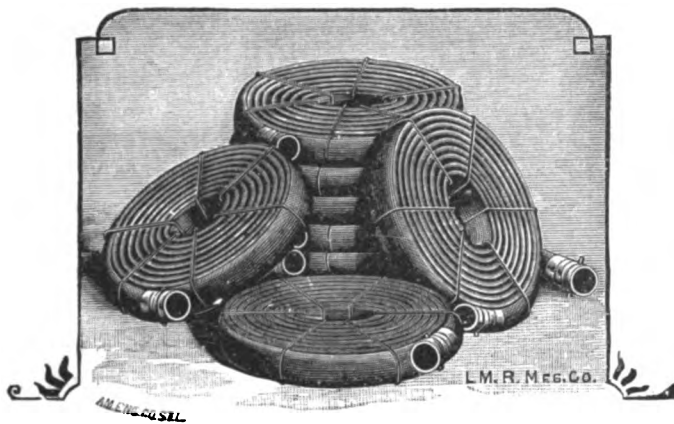


Plate 884.

STEAM HOSE.**EXTRA HEAVY STEAM, OIL AND
ROCK DRILL HOSE.**

FOUR-PLY—FOR 35 POUNDS STEAM OR LESS.

Internal Diam.	per ft.	Internal Diam.	per ft.
$\frac{1}{2}$ inch	\$0 51	$1\frac{1}{4}$ inch	\$1 04
$\frac{3}{4}$ inch	67	$1\frac{1}{2}$ inch	1 25
1 inch	83	2 inch	1 67

FIVE-PLY—FOR 50 POUNDS STEAM OR LESS.

Internal Diam.	per ft.	Internal Diam.	per ft.
$\frac{1}{2}$ inch	\$0 63	$1\frac{1}{4}$ inch	\$1 50
$\frac{3}{4}$ inch	83	$1\frac{1}{2}$ inch	1 56
1 inch	1 03	2 inch	2 07

SIX-PLY—FOR 75 POUNDS STEAM OR LESS.

Internal Diam.	per ft.	Internal Diam.	per ft.
$\frac{1}{2}$ inch	\$0 76	$1\frac{1}{4}$ inch	\$1 56
$\frac{3}{4}$ inch	1 00	$1\frac{1}{2}$ inch	1 87
1 inch	1 24	2 inch	2 49

RUBBER SUCTION HOSE.

ON SPIRAL WIRE.

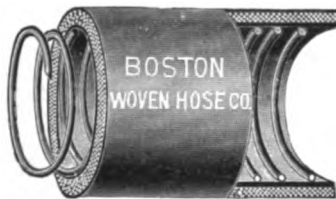


Plate 885.

SMOOTH BORE.

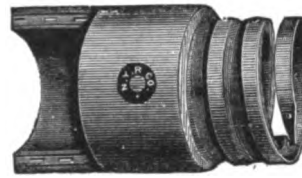


Plate 886.

Size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.	
On Spiral Wire, per foot	\$0 70	90	1 15	1 50	2 30	3 10	4 00	4 90	5 80	
Smooth Bore, per foot	.....	.....	.....	.....	2 60	3 50	4 50	5 50	6 50	
Size					5	6	7	8	10	12 in.
On Spiral Wire, per foot					\$7 60	9 50	12 00	15 00	20 00	25 00
Smooth Bore, per foot					8 50	10 50	13 50	16 50	22 50	27 50

AGRICULTURAL WIRED SUCTION HOSE.

WITH CAPPED ENDS.

In 10, 15, 20 and 25-foot lengths.

$1\frac{1}{2}$ inch, per foot	\$1 13
2 inch, per foot	1 50

HARD RUBBER SUCTION HOSE.

WITHOUT SPIRAL OR BAND. WILL NOT COLLAPSE.

Internal diameter	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Per foot	\$0 63	75	93	1 13	1 50	1 88

Small sizes kept on hand and cut into any lengths, as required. Larger sizes made to order with two weeks' notice.

RUBBER TUBING.

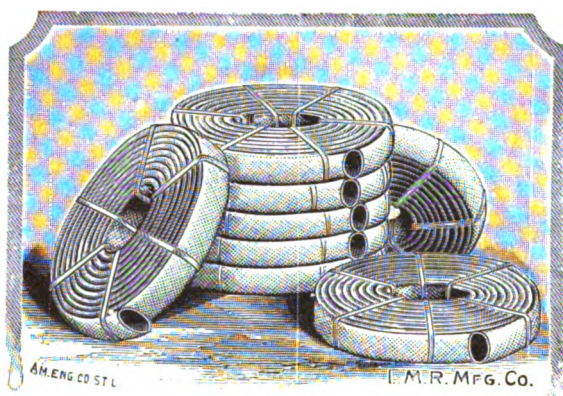
In lengths of 12 feet.

Internal diameter	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1 in.		
Plain, per foot	\$0 08	12	16	18	20	25	30	35	45

RUBBER VALVE BALLS.

Diameter	1 or less	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$ in.
Per doz.	\$1 00	1 40	1 90	2 50	3 25	4 00	4 75	5 50	6 50	8 00
Diameter	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{2}$	5	6 in.
Per doz.	\$10 50	13 00	15 50	19 50	23 50	29 25	35 00	54 50	70 00	115 00

We manufacture to order, Valve Balls, harder or softer than the usual make, at special rates.

COTTON MILL AND FIRE HOSE.**Plate 887.****IN 50 FEET LENGTHS.**

Internal diameter	1¼	1½	2	2¼	2½ in.
Per foot	\$0 45	50	60	65	70

Mill Hose is a seamless woven and rubber-lined cotton, one-ply fabric, more than equal in strength to a three-ply rubber hose, yet avoiding the bulkiness and weight of rubber hose.

**Plate 888.****UNLINED STANDARD LINEN HOSE.**

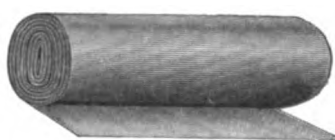
Seamless. In Lengths of 100 Feet.

1 inch diameter, per foot	\$0 20
1¼ inch diameter, per foot	22
1½ inch diameter, per foot	25
1¾ inch diameter, per foot	28
2 inch diameter, per foot	30
2¼ inch diameter, per foot	33
2½ inch diameter, Fire Department Size, per foot	35
3 inch diameter, per foot	50

RUBBER LINED STANDARD LINEN HOSE.

Seamless. In Lengths of 50 Feet.

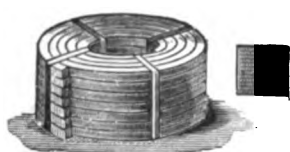
1¼ inch diameter, per foot	\$0 50
1½ inch diameter, per foot	55
2 inch diameter, per foot	65
2¼ inch diameter, per foot	70
2½ inch diameter, Fire Department Size, per foot	75

STEAM PACKING.**SHEET PACKING.****Plate 889.**

Either Cloth Insertion, Cloth on One, or Both Sides.

Thickness	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
One Ply, per lb.	\$0 70	65	60	55	...	...	...	...
Two Ply, per lb.	...	...	63	58	55	...	...	...
Three Ply, per lb.	...	...	66	61	58	55	...	...
Four Ply, per lb.	...	...	...	...	61	58	55	...

Pure Sheet Packing, per pound, \$1.40.

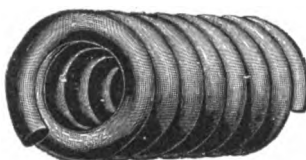
SQUARE PISTON PACKING. ROUND PISTON PACKING. RUBBER BACK PISTON PACKING.**Plate 890.****Plate 891.****Plate 892.**

Square and Round Piston Packing, in Lengths of 12 Feet.

Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$ in.
Plates 890 and 891	\$0 85	85	85	85	85	85	85	85	85	85
Plate 892	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00

STEAM PACKING, ETC.

American Hemp Packing, on reels, per lb.	\$0 16
Asbestos Cement, in $\frac{1}{2}$ barrels and barrels, per bbl.	6 00
Asbestos Mill Board, in sheets, per lb.	22
Asbestos Rope Packing, on reels, per lb.	30
Asbestos Sheet Packing, in rolls, per lb.	16
Asbestos Wick Packing, $\frac{1}{4}$ pound balls, per lb.	40
Eclipse Man-Hole Gaskets	65
Empire Gum Core Packing, square, round, or oval, on reels, per lb.	46
Eureka Gum Core Packing, square, round, or oval, on reels, per lb.	80
Flax Packing, square, in boxes, per lb.	50
Hair Felt, in rolls, per lb.	09
Italian Hemp Packing, on reels, per lb.	20
Jenkins' Sheet Packing, in rolls, per lb.	56
Jute Packing, on reels, per lb.	12
Lamp Wick Packing, 12 balls to pound, per lb.	30
Mineral Wool, in bags, per lb.	04
Pure Sheet Rubber Packing	.....
Pure Square Rubber Packing	.....
Rainbow Sheet Packing	.....
Soapstone Packing, on reels, per lb.	32
Usudurian Sheet Packing, in rolls, per lb.	1 00
Waste, colored, No. 1, per lb.	.....
Waste, colored, No. 2, per lb.	.....
Waste, white, No. 1, per lb.	.....
Waste, white, No. 2, per lb.	.....

SELDEN'S PISTON PACKING.**Plate 893.**

Either with or without a Rubber Core. Acknowledged by practical men to be the best Hydraulic and Steam Packing for Piston Rods or Plungers in the market.

With Rubber Core, per lb \$0 60
Without Rubber Core, per lb. 50

GARLOCK PACKING.

The Garlock Packing is thoroughly tested for the intense heat of stuffing-boxes; will not blow out or harden, and will not melt or gum on the rod.

Garlock Elastic Ring Packing, per lb \$1 20
Garlock Sectional Ring Packing, per lb. 1 20

**Plate 894.****SMOKY CITY PACKING.**

$\frac{1}{8}$, $\frac{1}{6}$, $\frac{3}{8}$ and $\frac{1}{4}$ inch, per foot. \$0 10
 $\frac{3}{8}$ inch and larger, per lb 50

$\frac{1}{8}$ to $\frac{1}{4}$ inch put up in 100-foot coils; $\frac{3}{8}$ to 1 inch put up in 15, 25 and 50 lb. coils; $1\frac{1}{4}$ inch and larger put up in 25-foot coils.

WIRE CLOTH INSERTION SHEET GUM PACKING.

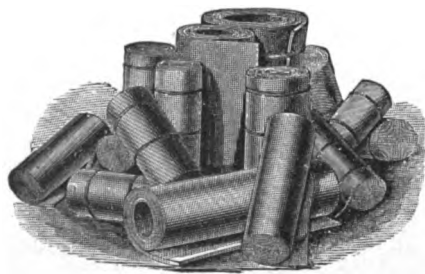
We can furnish this style of packing of any thickness or ply.

Per lb. \$1 00

**Plate 895.****PLUMBAGO PACKING.**

We keep on hand, at all times, in rolls like ordinary sheet rubber, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{6}$, $\frac{1}{4}$ and $\frac{3}{8}$ inch, from 36 to 40 inches wide.

Per lb. \$0 80

**Plate 896.**

MANILA AND SISAL ROPE.

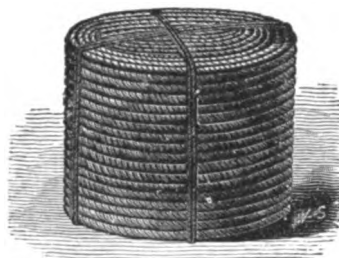


Plate 897.

APPROXIMATE WEIGHT AND STRENGTH OF CORDAGE.

Manila is about 10 per cent. stronger than Sisal. Working strain one-third of breaking strain.

Size in Circumference.	Size in Diameter.	Weight of 100 Feet Manila in lbs.	Weight of 100 Feet Tarred Hemp in lbs.	Strength of Manila Rope in lbs.	Length of Manila Rope in One lb.
6 th'd.	$\frac{1}{8}$ inch	2	3	540	50 feet.
9 th'd.	$\frac{1}{4}$ inch	3	4	780	33 feet 4 inches.
12 th'd.	$\frac{3}{8}$ inch	4	$5\frac{1}{2}$	1,000	25 feet.
15 th'd.	$\frac{1}{2}$ inch	5	7	1,280	20 feet.
$1\frac{1}{4}$ inch	$\frac{5}{8}$ inch	$6\frac{1}{8}$	9	1,562	17 feet 8 inches.
$1\frac{1}{2}$ inch	$\frac{3}{4}$ inch	8	10	2,250	13 feet.
$1\frac{3}{4}$ inch	$\frac{7}{8}$ inch	11	13	3,062	9 feet 3 inches.
2 inch	$\frac{1}{2}$ inch	$13\frac{1}{8}$	17	4,000	7 feet 6 inches.
$2\frac{1}{4}$ inch	$\frac{3}{4}$ inch	$16\frac{1}{2}$	21	5,000	6 feet.
$2\frac{1}{2}$ inch	$\frac{7}{8}$ inch	20	26	6,250	5 feet.
$2\frac{3}{4}$ inch	$\frac{1}{2}$ inch	24	32	7,500	4 feet 3 inches.
3 inch	1 inch	30	38	9,000	3 feet 6 inches.
$3\frac{1}{4}$ inch	$1\frac{1}{8}$ inch	35	66	10,500	3 feet.
$3\frac{1}{2}$ inch	$1\frac{1}{8}$ inch	41	50	12,250	2 feet 7 inches.
$3\frac{3}{4}$ inch	$1\frac{1}{4}$ inch	45	59	14,000	2 feet 3 inches.
4 inch	$1\frac{1}{4}$ inch	53	68	16,000	1 foot 11 inches.
$4\frac{1}{4}$ inch	$1\frac{1}{8}$ inch	60	76	18,062	1 foot 8 inches.
$4\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	66	85	20,250	1 foot 6 inches.
$4\frac{3}{4}$ inch	$1\frac{1}{8}$ inch	73	99	22,500	1 foot 5 inches.
5 inch	$1\frac{3}{8}$ inch	80	107	25,000	1 foot 3 inches.
$5\frac{1}{2}$ inch	$1\frac{3}{4}$ inch	97	129	30,250	1 foot.
6 inch	2 inch	115	155	36,000	$10\frac{3}{4}$ inches.
$6\frac{1}{2}$ inch	$2\frac{1}{8}$ inch	133	170	42,250	9 inches.
7 inch	$2\frac{1}{2}$ inch	154	208	49,000	$7\frac{3}{4}$ inches.
$7\frac{1}{2}$ inch	$2\frac{3}{8}$ inch	190	234	56,250	$6\frac{1}{2}$ inches.
8 inch	$2\frac{5}{8}$ inch	211	267	64,000	$5\frac{1}{2}$ inches.
$8\frac{1}{2}$ inch	$2\frac{7}{8}$ inch	238	297	72,250	5 inches.
9 inch	3 inch	270	340	81,000	$4\frac{1}{2}$ inches.
$9\frac{1}{2}$ inch	$3\frac{1}{8}$ inch	295	381	90,250	4 inches.
10 inch	$3\frac{3}{8}$ inch	340	425	100,000	$3\frac{1}{2}$ inches.

Length of Feet in Original Packages—Half Coils, 420 feet; Coils, 840 feet.

HEMP SASH AND BELL CORD.

$\frac{1}{4}$ and $\frac{1}{8}$, No. 4 thread, per lb. \$.....	$\frac{1}{4}$ and $\frac{1}{8}$, No. 12 thread, pat. laid, per lb. . \$.....
$\frac{1}{4}$ and $\frac{1}{8}$, No. 8 thread, per lb.	$\frac{3}{8}$ and $\frac{1}{4}$, No. 8 thread, per lb.
$\frac{1}{4}$ and $\frac{1}{8}$, No. 12 thread, per lb.	$\frac{3}{8}$ and $\frac{1}{4}$, No. 12 thread, per lb.

BRAIDED BELL CORD.

$\frac{1}{4}$ inch, fancy colors, per foot \$.....	$\frac{3}{8}$ inch, fancy colors, per foot \$.....
--	--

LATH YARN.

Manila, per foot \$.....	Russia Hemp, per foot \$.....
Sisal, per foot	American Hemp

PATENT FLATTENED STRAND ROPES.

Have 150 per cent more wearing surface than ordinary ropes.

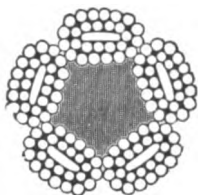


Plate 898.

SWEDES IRON HOISTING ROPE.

Diameter in inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Price per foot in cents	\$0 6 $\frac{1}{2}$	9 $\frac{1}{2}$	13	15 $\frac{1}{2}$	20 $\frac{1}{2}$	27	33 $\frac{1}{2}$
Breaking Strain in tons of 2,000 lbs	4	6	9	13	17	21	28
Average weight of Rope per foot	0.42	0.69	0.93	1.23	1.70	2.05	2.50
Minimum size of Drums or Sheaves in feet	1 $\frac{3}{4}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5
Diameter in inches	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	
Price per foot in cents	\$0 40	48	53	67	78	99	
Breaking Strain in tons of 2,000 lbs	34	40	45	54	66	75	
Average weight of Rope per foot	3.17	3.71	4.33	5.00	6.50	8.50	
Minimum size of Drums or Sheaves in feet	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	9	10	

CRUCIBLE CAST STEEL HOISTING ROPE.

Diameter in inches.	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Price per foot in cents	\$0 09	11 $\frac{1}{2}$	15	19 $\frac{1}{2}$	24 $\frac{1}{2}$	32 $\frac{1}{2}$	39
Breaking Strain in tons of 2,000 lbs	9	15	20	26 $\frac{1}{2}$	34 $\frac{1}{2}$	43	53 $\frac{3}{4}$
Average weight per foot	0.42	0.69	0.93	1.23	1.70	2.05	2.50
Minimum size of Drum or Sheaves in feet	1 $\frac{1}{2}$	2	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5
Diameter in inches.	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	
Price per foot in cents	\$0 46 $\frac{1}{2}$	56	62	78	93 $\frac{1}{2}$	1 20	
Breaking Strain in tons of 2,000 lbs	68	80	90	109	137	169	
Average weight per foot	3.17	3.71	4.33	5.00	6.50	8.50	
Minimum size of Drums or Sheaves in feet	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{4}$	8	9	

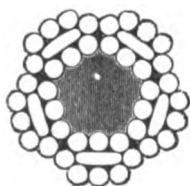


Plate 899.

SWEDES IRON HAULAGE AND TRANSMISSION ROPE.

Diameter in inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Price per foot in cents	\$0 4 $\frac{1}{4}$	6	9	13	18	23 $\frac{1}{2}$	30	36 $\frac{1}{2}$
Average weight per foot	0.25	0.43	0.68	0.91	1.24	1.64	2.08	2.50

CRUCIBLE CAST STEEL HAULAGE AND TRANSMISSION ROPE.

Diameter in inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Price per foot in cents	\$0 5 $\frac{1}{4}$	8 $\frac{1}{2}$	11 $\frac{1}{2}$	15	19 $\frac{1}{2}$	24 $\frac{1}{2}$	30
Average weight per foot	0.42	0.69	0.93	1.23	1.70	2.05	2.50

WIRE ROPE.**SWEDEN IRON.****Plate 900.****CRUCIBLE STEEL.**

7 Wires to the Strand. Hemp Centers.

7 Wires to the Strand. Hemp Centers.

Diameter in Inches.	Price per Foot in Cents.	Breaking Strain in Tons of 2,000 Lbs.	Proper Working Load in Tons of 2,000 Lbs.	Average Weight per Foot.	Diameter in Inches.	Price per Foot in Cents.	Breaking Strain in Tons of 2,000 Lbs.	Proper Working Load in Tons of 2,000 Lbs.	Average Weight per Foot.
$\frac{3}{8}$	2	1.03	.....	.125	$\frac{3}{8}$	$2\frac{3}{4}$	3	$\frac{3}{4}$	.16
$\frac{7}{16}$	$2\frac{1}{2}$	1.38	.....	.16	$\frac{7}{16}$	$3\frac{1}{4}$	4	1	.20
$\frac{1}{2}$	3	1.65	.....	.20	$\frac{1}{2}$	4	5	1	.28
$\frac{9}{16}$	$3\frac{1}{2}$	2.13	$\frac{1}{2}$	.28	$\frac{9}{16}$	$4\frac{3}{4}$	7	$1\frac{1}{4}$	.35
$\frac{5}{8}$	4	2.83	$\frac{3}{4}$	.35	$\frac{5}{8}$	$5\frac{1}{2}$	9	$1\frac{3}{4}$	.44
$\frac{11}{16}$	5	4.10	1	.44	$\frac{11}{16}$	7	$11\frac{1}{2}$	2	.65
$\frac{3}{4}$	$6\frac{1}{2}$	5.80	$1\frac{1}{2}$	.69	$\frac{3}{4}$	$8\frac{1}{2}$	14	3	.70
$\frac{7}{8}$	$7\frac{1}{2}$	7.60	2	.75	$\frac{7}{8}$	10	17	$3\frac{1}{2}$	.88
1	9	8.80	$2\frac{1}{4}$	.88	1	14	22	$4\frac{1}{2}$	1.20
$1\frac{1}{8}$	$11\frac{1}{2}$	12.30	3	1.12	$1\frac{1}{8}$	18	30	6	1.50
$1\frac{1}{4}$	15	16.	4	1.50	$1\frac{1}{4}$	23	36	7	2.00
$1\frac{3}{8}$	19	20.	5	1.90	$1\frac{3}{8}$	28	44	9	2.44
$1\frac{1}{2}$	23	25.	$6\frac{1}{4}$	2.40	$1\frac{1}{2}$	33	52	10	3.00
	28	30.	$7\frac{1}{2}$	2.95		39	62	13	3.65
	33	36.	9	3.50	.....	.....	.....	.....	.....

These Ropes are principally used for Derricks, Guys, Steamboat Rigging, Ferries, Transmission of Power, etc.

**Plate 901.****SWEDEN IRON PLIABLE HOISTING ROPES.****CRUCIBLE CAST STEEL PLIABLE HOISTING ROPES.**

19 Wires to the Strand. Hemp Centers.

19 Wires to the Strand. Hemp Centers.

Diameter in Inches.	Price per Foot in Cents.	Breaking Strain in Tons of 2,000 Lbs.	Diam. of Hemp Rope of Equal Strength, in.	Proper Working Load in Tons of 2,000 Lbs.	Average Weight of Rope per Ft.	Minimum Size of Drums or Sheaves in Ft.	Diameter in Inches.	Price per Foot in Cents.	Breaking Strain in Tons of 2,000 Lbs.	Diam. of Hemp Rope of Equal Strength, in.	Proper Working Load in Tons of 2,000 Lbs.	Average Weight per Foot.	Minimum Size of Drums or Sheaves in Ft.
$\frac{3}{8}$	$4\frac{1}{2}$	2.50	$\frac{7}{8}$	$1\frac{1}{4}$	.26	1	$\frac{7}{8}$	$6\frac{1}{2}$	6	$1\frac{1}{4}$	$\frac{3}{4}$	.29	2
$\frac{7}{16}$	$4\frac{3}{4}$	3.10	1	$\frac{3}{8}$	.29	$1\frac{1}{2}$	$\frac{1}{2}$	7	$7\frac{1}{2}$	$1\frac{1}{2}$	1	.35	$2\frac{1}{4}$
$\frac{1}{2}$	5	3.50	$1\frac{1}{8}$	$\frac{1}{2}$	.35	$1\frac{3}{4}$	$\frac{9}{16}$	8	9	$1\frac{3}{8}$	$1\frac{1}{4}$	.45	$2\frac{3}{4}$
$\frac{9}{16}$	$6\frac{1}{2}$	4.30	$1\frac{1}{4}$	$\frac{3}{4}$	.44	2	$\frac{5}{8}$	9	$14\frac{1}{2}$	$1\frac{3}{4}$	2	.70	3
$\frac{5}{8}$	$7\frac{1}{2}$	5.25	$1\frac{1}{2}$	1	.70	$2\frac{1}{2}$	$\frac{3}{4}$	$11\frac{1}{2}$	18	$2\frac{1}{8}$	3	.90	$3\frac{1}{2}$
$\frac{3}{4}$	10	8.75	$1\frac{3}{8}$	$1\frac{1}{4}$	.88	3	$\frac{7}{8}$	15	25	$2\frac{3}{8}$	4	1.20	$3\frac{3}{4}$
$\frac{7}{8}$	12	11.50	2	$2\frac{1}{2}$	1.20	$3\frac{1}{2}$	1	19	33	3	5	1.60	4
1	16	16.	$2\frac{1}{4}$	3	1.58	4	$1\frac{1}{8}$	25	42	$3\frac{3}{8}$	7	2.00	$4\frac{1}{2}$
$1\frac{1}{8}$	21	20.	$2\frac{3}{8}$	4	2.00	$4\frac{1}{2}$	$1\frac{1}{4}$	30	52	$3\frac{3}{4}$	9	2.50	5
$1\frac{1}{4}$	26	27.	$3\frac{1}{8}$	$5\frac{1}{2}$	2.50	5	$1\frac{3}{8}$	36	63	4	10	3.00	$5\frac{1}{4}$
$1\frac{3}{8}$	31	33.	$3\frac{1}{4}$	$6\frac{1}{2}$	3.00	6	$1\frac{1}{2}$	43	77	$4\frac{1}{4}$	12	3.65	$5\frac{1}{2}$
$1\frac{1}{2}$	37	39.	$3\frac{1}{2}$	8	3.65	$6\frac{1}{2}$	$1\frac{5}{8}$	48	86	$4\frac{3}{4}$	15	4.10	6
$1\frac{3}{8}$	41	44.	4	9	4.10	7	$1\frac{3}{4}$	60	106	$5\frac{1}{4}$	18	5.25	$7\frac{1}{2}$
$1\frac{3}{4}$	52	54.	$4\frac{1}{4}$	11	5.25	$7\frac{1}{2}$	2	72	125	.....	25	6.30	$8\frac{1}{2}$
2	60	65.	$4\frac{3}{4}$	13	6.30	9	$2\frac{1}{4}$	92	160	.....	30	8.00	$9\frac{1}{2}$
$2\frac{1}{4}$	76	74.	$5\frac{1}{3}$	15	8.00	10							
$2\frac{1}{2}$	.....	82.	.....	.....	10.40	12							

N. B.—When made with Wire Center, the price per foot is 10 per cent extra.

WIRE ROPE FASTENINGS.

CLOSED SOCKET.

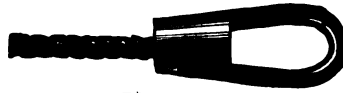


Plate 902.

Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes	
	Loose	Fastened	Loose	Fastened		Loose	Fastened	Loose	Fastened
2 1/4	\$14 25	\$16 50	\$11 25	\$13 50	1 1/8	\$3 25	\$4 50	\$2 25	\$3 50
2	12 50	14 25	9 00	11 00	1	2 75	3 75	2 00	3 00
1 3/4	10 75	12 50	7 50	9 25	7/8	2 25	3 25	1 50	2 50
1 1/2	9 00	10 50	6 00	7 50	3/4	1 85	2 75	1 20	2 10
1 1/4	7 50	9 00	4 50	6 00	5/8	1 50	2 25	1 00	1 75
1 3/8	6 00	7 25	3 25	4 50	1/2	1 20	1 80	.85	1 50
1 1/4	4 50	5 75	2 75	4 00	3/8	1 15	1 60	.75	1 20

OPEN SOCKET



Plate 903.

Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes	
	Loose	Fastened	Loose	Fastened		Loose	Fastened	Loose	Fastened
2 1/4	\$16 50	\$19 00	\$12 50	\$15 00	1 1/8	\$4 00	\$5 00	\$3 00	\$4 00
2	14 25	16 25	10 50	12 50	1	3 25	4 25	2 50	3 50
1 3/4	12 50	14 00	9 00	10 50	7/8	2 75	3 75	2 00	3 00
1 1/2	10 50	12 00	7 25	8 75	3/4	2 50	3 40	1 75	2 60
1 1/4	8 75	10 25	5 50	7 00	5/8	2 00	2 75	1 50	2 25
1 3/8	7 25	8 50	4 00	5 25	1/2	1 70	2 30	1 25	2 00
1 1/4	5 50	6 50	3 25	4 25	3/8	1 50	2 00	1 20	1 65

HOOK AND SOCKET.



Plate 904.

Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes	
	Loose	Fastened	Loose	Fastened		Loose	Fastened	Loose	Fastened
1 1/4	\$6 25	\$7 25	\$4 30	\$5 30	3/4	\$3 05	\$3 85	\$2 30	\$3 10
1 1/8	5 00	6 00	3 75	4 75	5/8	2 65	3 40	2 00	2 75
1	4 15	5 10	3 20	4 15	1/2	2 35	3 10	1 90	2 45
7/8	3 55	4 50	2 75	3 70	3/8	1 90	2 45	1 50	2 05

SOCKET WITH SWIVEL HOOK.

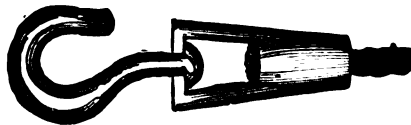
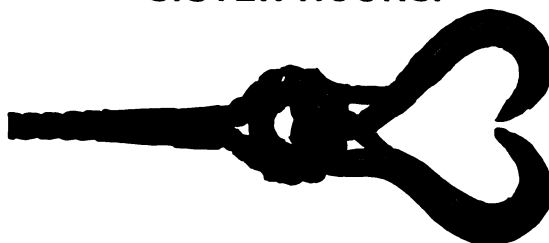


Plate 905.

Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes	
	Loose	Fastened	Loose	Fastened		Loose	Fastened	Loose	Fastened
2 1/4	\$19 50	\$21 75	\$16 00	\$18 25	1 1/8	\$5 25	\$6 25	\$4 25	\$5 25
2	17 50	19 50	14 25	16 25	1	4 50	5 50	3 75	4 75
1 3/4	15 50	17 00	12 00	14 00	7/8	4 25	5 15	3 25	4 25
1 1/2	12 75	14 25	9 50	11 00	3/4	3 75	4 65	3 05	4 00
1 1/4	9 75	11 25	6 75	8 25	5/8	3 35	4 15	2 90	3 70
1 3/8	8 25	9 50	5 50	6 75	1/2	3 00	3 60	2 65	3 25
1 1/4	6 50	7 50	4 50	5 50	3/8	2 65	3 10	2 25	2 70

HOOKS AND THIMBLES.**Plate 906.**

Diam. of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		Diam. of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes	
	Loose	Fastened	Loose	Fastened		Loose	Fastened	Loose	Fastened
1 1/4	\$3 00	\$5 25	\$2 55	\$4 50	3/4	\$1 30	\$2 80	\$1 15	\$2 25
1 1/8	2 50	4 35	1 90	3 60	5/8	1 22	2 50	1 00	2 00
1	1 90	3 75	1 50	3 00	1/2	95	2 10	90	1 80
7/8	1 50	3 25	1 30	2 65	3/8	80	1 70	75	1 40

SISTER HOOKS.**Plate 907.**

Diameter of Rope	For Cast Steel Rope			For Iron, Bessemer or Galvanized Ropes	
	Loose	Fastened		Loose	Fastened
1 1/4	\$3 00	\$5 25		\$2 55	\$4 50
1 1/8	2 50	4 35		1 90	3 60
1	1 90	3 75		1 50	3 00
7/8	1 50	3 25		1 30	2 65
3/4	1 30	2 80		1 15	2 25
5/8	1 20	2 50		1 00	2 00
1/2	95	2 10		90	1 80
3/8	80	1 70		75	1 40

THIMBLES SPLICED IN.**Plate 908.**

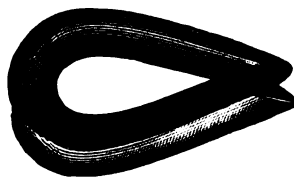
Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		Diameter of Rope	For Cast Steel Ropes		For Iron, Bessemer or Galvanized Ropes		
1¼	• • •	\$3 60	• • • • •	\$3 00	• • • • •	¾	• • • • •	\$1 60	• • • • •	\$1 30
1⅝	• • •	2 65	• • • • •	2 25	• • • • •	5⁄8	• • • • •	1 35	• • • • •	1 15
1	• • •	2 25	• • • • •	1 90	• • • • •	½	• • • • •	1 20	• • • • •	1 00
7⁄8	• • •	1 90	• • • • •	1 60	• • • • •	3⁄8	• • • • •	1 05	• • • • •	85

WIRE ROPE CLAMPS.**Plate 909.**

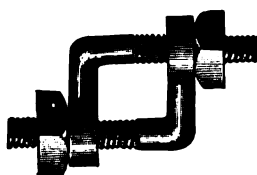
Sizes	1/8	1/2	1	5/8	3/4	1 1/8	7/8	1	1 1/8	1 1/2	1 3/4	1 1/2
Prices	\$0 70	85	90	90	1 00	1 10	1 20	1 30	1 45	1 55	1 65	1 80

EXTRA HEAVY WIRE ROPE THIMBLES.

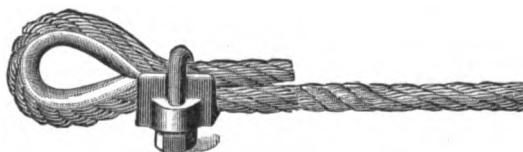
GALVANIZED.

**Plate 910.**

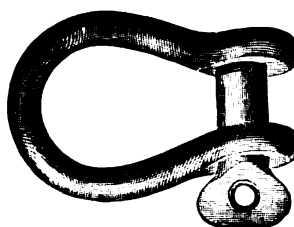
For size Rope	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Each	\$0 15	19	22	26	30

WIRE ROPE CLIPS.**Plate 911.**

Size Rope	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Each	\$0 13	15	20	22	25	32	40

THE CROSBY WIRE ROPE CLIP.**Plate 912.**

Diameter of Rope	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Each	\$0 25	30	35	40	45	50	50	55	60

WIRE ROPE SHACKLES.**Plate 913.**

Size thickness of Iron	$\frac{7}{8}$	1	$1\frac{1}{4}$
Each	\$1 80	2 20	3 15

PATENT INSIDE IRON STRAPPED BLOCKS.

STEEL PINS, IRON SHEAVES.

SINGLE.**Plate 914.****DOUBLE.****Plate 915.****TRIPLE.****Plate 916.****SINGLE
BECKET.****Plate 917.****DOUBLE BECKET.****Plate 918.****TRIPLE BECKET.****Plate 919.****ORDINARY MORTISE.**

With anything except Loose Swivel Hooks and Swivel Jaws.

Size.	For Rope, Inches.	Iron-Bushed			Roller-Bushed		
		Single	Double	Triple	Single	Double	Triple
3	$\frac{5}{8}$	\$ 70	\$ 1 30	\$ 1 75	\$ 1 10	\$ 2 00	\$ 2 90
3 $\frac{1}{2}$	$\frac{3}{4}$	75	1 45	2 00	1 15	2 20	3 15
4	$\frac{1}{2}$	85	1 60	2 15	1 20	2 25	3 25
5	$\frac{5}{8}$	90	1 75	2 25	1 25	2 35	3 50
6	$\frac{3}{4}$	1 10	2 00	2 90	1 50	2 85	4 40
7	$\frac{7}{8}$	1 30	2 40	3 50	1 70	3 35	5 00
8	1	1 65	2 85	4 25	2 25	4 15	6 00
9	1	1 85	3 40	4 75	2 50	4 70	7 25
10	1 $\frac{1}{8}$	2 75	4 50	6 25	3 50	6 00	8 50
11	1 $\frac{1}{8}$	4 45	7 50	10 65	5 30	9 20	13 20
12	1 $\frac{1}{4}$	4 45	7 50	10 65	5 30	9 20	13 20
13	1 $\frac{1}{4}$	7 00	10 50	15 00	8 15	12 80	18 45
14	1 $\frac{3}{8}$	7 00	10 50	15 00	8 15	12 80	18 45
15	1 $\frac{1}{2}$	8 00	13 00	18 00	9 25	15 50	21 75
16	1 $\frac{5}{8}$	10 00	15 00	22 00	11 50	18 00	26 50

SPECIAL NOTICE.—Please specify in orders size of Block, whether Single, Double, or Triple, and whether with or without Becket.

OPENED.

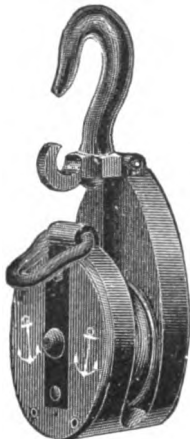


Plate 920.

SNATCH BLOCKS.**LOCKPORT PATTERN.**

Wood Shell, Edge Bolted. Swivel Hook. Steel Pin with Nut.

Size	6	7	8	9	10	12 inch
Rope	$\frac{7}{8}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$ inch
Iron Bushed . .	\$4 00	4 75	5 75	6 75	8 50	10 00 each
Bronze Bushed .	.....	.....	.....	.....	.....	..... each
Size	14	16	18	20	22	24 inch
Rope	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$ inch
Iron Bushed . .	\$13 00	17 00	25 00	38 00	55 00	70 00 each
Bronze Bushed .	.....	.....	.....	.....	.....	..... each

CLOSED.

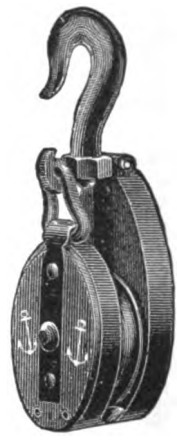


Plate 921.

ROPE STRAPPED BLOCKS.

STEEL PINS. IRON SHEAVES.

SINGLE.



Plate 922.

DOUBLE.



Plate 923.

TRIPLE.



Plate 924.

Dimensions			Iron Bushed			Roller Bushed		
Sheave Inches	For Rope Inches	Shell Inches	Single Each	Double Each	Triple Each	Single Each	Double Each	Triple Each
$1\frac{3}{4}$ by $\frac{1}{2}$	$\frac{1}{8}$	3	\$ 0 65	\$1 05	\$1 60	\$1 00	\$1 85	\$2 75
2 by $\frac{1}{2}$	$\frac{3}{8}$	$3\frac{1}{2}$	70	1 15	1 75	1 05	2 00	3 00
$2\frac{1}{4}$ by $1\frac{1}{8}$	$\frac{1}{2}$	4	76	1 30	2 00	1 10	2 15	3 15
3 by $1\frac{1}{8}$	$\frac{5}{8}$	5	83	1 58	2 10	1 20	2 35	3 50
$3\frac{1}{2}$ by $1\frac{1}{8}$	$\frac{3}{4}$	6	1 05	1 80	2 60	1 45	2 75	4 20
$4\frac{3}{8}$ by $1\frac{1}{8}$	$\frac{7}{8}$	7	1 25	2 25	3 30	1 65	3 25	4 75
5 by $1\frac{3}{8}$	1	8	1 54	2 60	3 75	2 15	3 85	5 75
$5\frac{3}{4}$ by $1\frac{3}{8}$	1	9	1 80	3 25	4 50	2 50	4 50	7 00
$6\frac{1}{4}$ by $1\frac{3}{8}$	$1\frac{1}{8}$	10	2 50	4 25	5 90	3 30	5 75	8 35
$7\frac{3}{8}$ by $1\frac{3}{8}$	$1\frac{1}{2}$	11	4 00	6 50	9 50	4 90	8 00	12 50
8 by $1\frac{3}{8}$	$1\frac{1}{4}$	12	4 00	6 50	9 50	4 90	8 00	12 50
$8\frac{5}{8}$ by $1\frac{3}{8}$	$1\frac{3}{4}$	13	6 00	9 50	13 50	7 50	11 00	17 00
9 by $1\frac{1}{2}$	$1\frac{3}{8}$	14	6 00	9 50	13 50	7 50	11 00	17 00

For Blocks with mortise wider than above, add 10 per cent to list for each extra $\frac{1}{4}$ inch or fraction thereof. In ordering, be particular to give the size of block, and whether Roller or Iron Bushed.

HEAVY TACKLE, THICK MORTISE BLOCKS.

EXTRA HEAVY INSIDE IRON STRAPS AND HOOKS, CHEEKS EDGE BOLTED. COMMON LOOSE HOOKS, RINGS OR SHACKLES, IRON SHEAVES.

SINGLE.

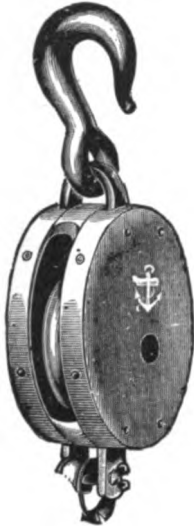


Plate 925.

DOUBLE.

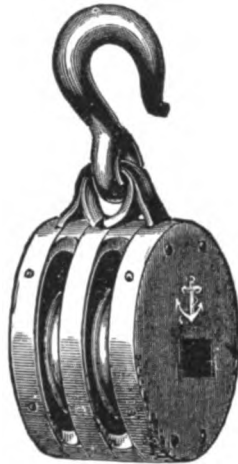


Plate 926.

TRIPLE.



Plate 927.

With anything except Loose Swivel Hooks.

Iron Bushed.					Roller Bushed.		
Size	For Rope, Inches	Single	Double	Triple	Single	Double	Triple
7	1	\$ 2 25	4 00	5 50	3 00	5 50	7 75
8	1 $\frac{1}{8}$	2 75	4 50	6 30	3 50	6 00	8 55
9	1 $\frac{1}{4}$	3 15	5 25	7 25	4 00	6 95	9 80
10	1 $\frac{3}{8}$	4 00	6 50	8 50	5 25	9 00	12 25
12	1 $\frac{1}{2}$	5 25	8 50	12 50	6 50	11 00	16 25
14	1 $\frac{5}{8}$	8 00	13 00	17 00	9 75	16 50	22 25
16	2	11 50	18 00	28 00	14 00	23 00	35 50
18	2 $\frac{1}{4}$	\$15 00	29 00	42 00	18 00	35 00	52 00
20	2 $\frac{3}{4}$	21 00	37 00	54 00	25 00	45 00	65 00
22	3	26 00	48 00	70 00	.....	.....	.....
24	3 $\frac{1}{2}$	32 00	56 00	84 00	.....	.....	.....

SPECIAL NOTICE.—Specify in all orders whether Blocks are to be Single, Double or Triple, Iron or Roller Bushed and with or without Becket.

Our Thick Mortise Blocks are especially well adapted for railroad, mining and contractors' work.

STEEL TACKLE BLOCKS.

SINGLE.

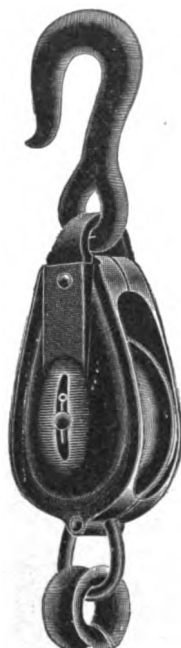


Plate 928.

DOUBLE.

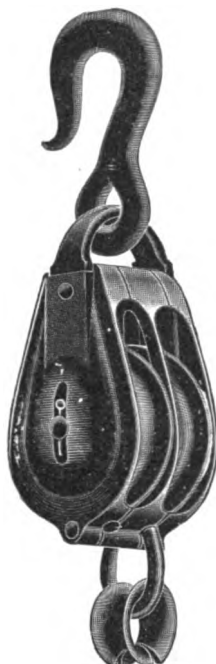


Plate 929.

TRIPLE.

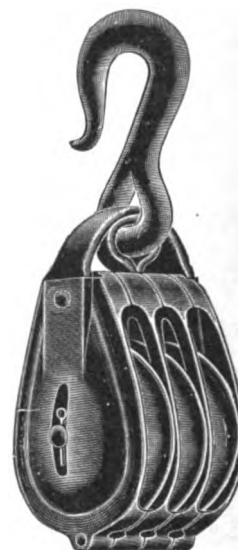


Plate 930.

REGULAR MORTISE TACKLE BLOCKS.

Dimensions		Plain Bushed			Roller Bushed		Self-Lub. Phos. Bronze Bushed	
Length of Shell	Diam. of Rope		Price	Trade No.	Price	Trade No.	Price	Trade No.
4 inch,	½ inch,	{ Single	\$ 0 90	1	.....	.....	\$ 1 65	301
		{ Double	1 75	3	.....	.....	3 25	303
		{ Triple	2 50	5	.....	.....	4 75	305
5 inch,	⅝ inch,	{ Single	1 00	7	\$1 50	8	1 80	307
		{ Double	1 90	9	2 90	10	3 50	309
		{ Triple	2 75	11	4 25	12	5 15	311
6 inch,	¾ inch,	{ Single	1 25	13	1 75	14	2 10	313
		{ Double	2 25	15	3 25	16	4 00	315
		{ Triple	3 25	17	4 75	18	5 80	317
7 inch,	⅞ inch,	{ Single	1 50	19	2 10	20	2 45	319
		{ Double	2 70	21	3 85	22	4 60	321
		{ Triple	4 00	23	5 80	24	6 85	323
8 inch,	1 inch,	{ Single	1 85	25	2 55	26	2 90	325
		{ Double	3 20	27	4 60	28	5 30	327
		{ Triple	4 75	29	6 85	30	7 90	329
9 inch,	1 ⅛ inch,	{ Single	2 40	31	3 20	32	3 55	331
		{ Double	4 00	33	5 60	34	6 30	333
		{ Triple	5 50	35	7 90	36	9 00	335
10 inch,	1 ¼ inch,	{ Single	3 10	37	4 05	38	4 40	337
		{ Double	5 10	39	7 00	40	7 70	339
		{ Triple	7 00	41	9 85	42	11 00	341
12 inch,	1 ⅜ inch,	{ Single	5 00	43	6 00	44	6 45	343
		{ Double	8 25	45	10 35	46	11 15	345
		{ Triple	11 75	47	14 90	48	16 00	347
14 inch,	1 ½ inch,	{ Single	7 50	49	8 75	50	9 10	349
		{ Double	11 75	51	14 25	52	15 00	351
		{ Triple	16 50	53	20 25	54	21 30	353

All the above Blocks are equivalent to wide mortise wooden blocks, giving plenty of room for the rope. Our Plain, Roller-bushed, and Self-lubricating Sheaves are interchangeable.

WIDE MORTISE HEAVY PURCHASE BLOCKS.

WITH RINGS, HOOKS OR SHACKLES.

**Plate 931.****Plate 932.**

Dimensions.		Plain Bushed.		Self-Lub. Phos. Bronze Bushed.	
Length of Shell	Diameter Rope.	Price.	Trade No.	Price.	Trade No.
12 in.	1 1/4 in.	Single..	\$ 6 25	169	\$ 7 85
		Double..	10 25	171	13 50
		Triple..	15 00	173	20 00
14 in.	1 1/4 in.	Single..	9 00	175	10 80
		Double..	15 00	177	18 50
		Triple..	20 00	179	25 50
16 in.	2 in.	Single..	13 00	181	15 00
		Double..	21 00	183	25 00
		Triple..	32 00	185	38 00

These Blocks are designed for heavy work. When fitted with the self-lubricating bushing, they run very easily.

WIDE MORTISE BLOCKS WITH STIFF SWIVEL HOOKS.

Dimensions.		Plain Bushed.				Self-Lubricating Phos. Bronze Bushed.			
Length of Shell.	Diameter Rope.	Single.	Trade No.	Double.	Trade No.	Single.	Trade No.	Double.	Trade No.
6 in.	1/2	\$ 2 00	115	\$ 3 25	117	\$ 2 85	116	\$ 5 00	118
8 in.	1	2 75	119	4 75	121	3 80	120	6 85	122
9 in.	1 1/4	3 50	123	6 00	125	4 65	124	8 30	126
10 in.	1 1/2	4 50	127	7 50	129	5 80	128	10 00	130
12 in.	1 3/4	6 50	131	11 00	133	8 00	132	14 25	134
14 in.	2	9 00	135	15 00	137	11 00	136	18 50	138
16 in.	2 1/2	13 00	139	22 00	141	15 00	140	26 00	142

We can furnish any of our Blocks galvanized at slight extra cost.

**Plate 933.****Plate 934.**

PATENT STEEL SNATCH BLOCKS.

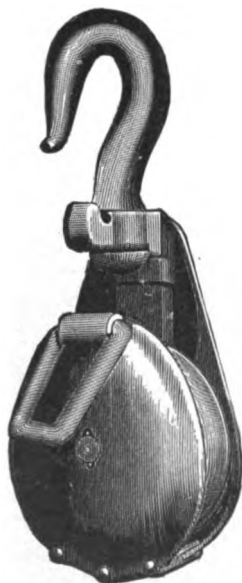
FOR WIRE ROPE.

**Plate 935.**Self-Lubricating
Phos. Bronze Bushed

	Price	Trade No.
Diameter of Sheave, 10 inch; diameter of Rope, $\frac{1}{2}$ inch	\$18 00	213
Diameter of Sheave, 12 inch; diameter of Rope, $\frac{5}{8}$ inch	21 90	215
Diameter of Sheave, 14 inch; diameter of Rope, $\frac{3}{4}$ inch	24 00	217
Diameter of Sheave, 16 inch; diameter of Rope, $\frac{7}{8}$ inch	30 00	219
Diameter of Sheave, 18 inch; diameter of Rope, 1 inch	40 00	221
Diameter of Sheave, 20 inch; diameter of Rope, $1\frac{1}{8}$ inch	52 00	223

The increasing use of Wire Rope is causing quite a demand for the above Blocks, as they are unequalled.

OPEN.

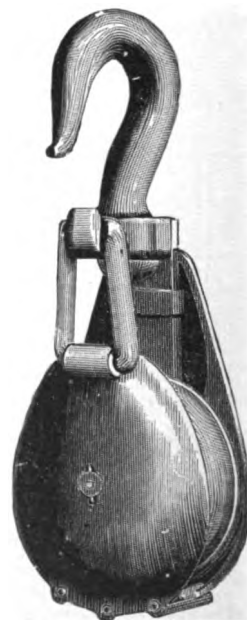
**Plate 936.****NEW STYLE PATENT AUTOMATIC SNATCH BLOCKS.**

Length of Shell	Plain Bushed		Self-Lub. Phos. Bronze Bushed	
	Price	Trade No.	Price	Trade No.
7 inch,	\$ 4 75	200	\$ 5 50	201
8 inch,	5 75	202	7 00	203
10 inch,	8 50	204	9 00	205
12 inch,	10 00	206	11 50	207
14 inch,	13 00	208	15 00	209
16 inch,	17 00	210	20 00	211

We claim for these Snatch Blocks superiority at every point over anything in the world.

Properly fastened they will never break.

CLOSED.

**Plate 937.**

MALLEABLE IRON BLOCKS.

FOR WIRE ROPE.

**Plate 938.**

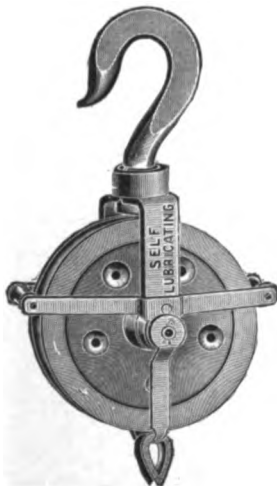
Length of Shell	Diam. of Sheave	Diam. of Rope		Price	Trade No.
14 inch	10 inch	$\frac{1}{2}$ to $\frac{5}{8}$ inch	{ Single	\$ 9 50	55
			{ Double	17 50	57
			{ Triple	25 50	59
16 inch	12 inch	$\frac{3}{8}$ to $\frac{3}{4}$ inch	{ Single	12 50	61
			{ Double	23 00	63
			{ Triple	31 00	65
18 inch	14 inch	$\frac{7}{8}$ to 1 inch	{ Single	18 00	67
			{ Double	30 00	69
			{ Triple	43 50	71

**Plate 939.**

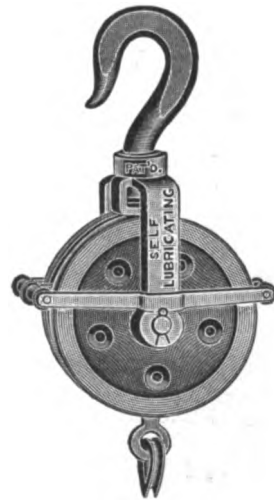
These Blocks are all fitted with our Self-Lubricating Phos. Bronze Bushings, and while very strong, are made with special reference to lightness, for ease in handling.

PATENT STEEL BLOCKS.

FOR WIRE ROPE.

**Plate 940.**

Diam. of Sheave	Diam. of Rope		Price	Trade No.
10 inch	$\frac{1}{2}$ inch	{ Single	\$11 00	73
		{ Double	18 00	75
12 inch	$\frac{5}{8}$ inch	{ Single	12 50	77
		{ Double	20 00	79
14 inch	$\frac{3}{4}$ inch	{ Single	15 00	81
		{ Double	23 00	83
16 inch	$\frac{7}{8}$ inch	{ Single	18 00	85
		{ Double	27 00	87
18 inch	1 inch	{ Single	23 00	89
		{ Double	32 00	91
20 inch	$1\frac{1}{8}$ inch	{ Single	28 00	93
		{ Double	38 00	95

**Plate 941.**

These Sheaves are all fitted with Self-Lubricating Phos. Bronze Bushings. They are cheaper, stronger and lighter than any other blocks for same size of wire rope. These Blocks all have roller guards to keep rope in place.

WESTON'S DIRECT DIFFERENTIAL PULLEY BLOCK.

One man can lift 1,000 pounds.

They hold the load at any point and cannot run down.

PRICE LIST OF DIRECT BLOCKS.

Capacity	Price, Complete with regular length Chains, Boxed	Chain		Hoist See Note.*	Net Weight Complete
		Regular Length	Extra Chain Per Foot		
$\frac{1}{8}$ Ton.	\$10 00	18 feet.	35 cents.	5 feet.	11 lbs.
$\frac{1}{4}$ Ton.	13 00	22 feet.	36 cents.	6 feet.	22 lbs.
$\frac{1}{2}$ Ton.	15 00	26 feet.	38 cents.	7 feet.	30 lbs.
1 Ton.	20 00	30 feet.	40 cents.	8 feet.	51 lbs.
$1\frac{1}{2}$ Ton.	25 00	33 feet.	42 cents.	$8\frac{1}{2}$ feet.	81 lbs.
2 Ton.	30 00	36 feet.	44 cents.	9 feet.	122 lbs.
3 Ton.	40 00	38 feet.	48 cents.	$9\frac{1}{2}$ feet.	173 lbs.

Extra Length of Chains.—Allow about 4 feet of chain for each foot of extra hoist.

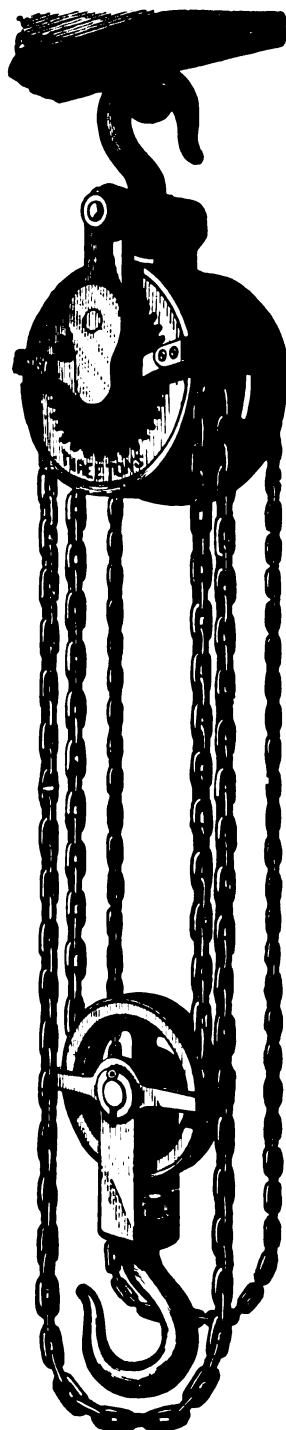
*NOTE.—Figures in fifth column denote approximate height which blocks, with regular length of chain, will hoist from level on which operator stands.

PRICES OF DIRECT PULLEY BLOCK PARTS.

Capacity	Sheaves		Yokes and Hooks		Pins	
	Top	Bottom	Top	Bottom	Top	Bottom
$\frac{1}{8}$ Ton.	\$1 25	\$ 50	\$2 00	\$1 25	\$ 60	\$ 50
$\frac{1}{4}$ Ton.	1 50	75	2 50	2 00	65	55
$\frac{1}{2}$ Ton.	2 00	1 00	3 00	2 50	70	60
1 Ton.	2 50	1 25	3 75	3 00	80	70
$1\frac{1}{2}$ Ton.	3 50	1 50	4 75	3 75	1 00	80
2 Ton.	5 00	2 00	6 50	4 50	1 25	1 00
3 Ton.	6 50	3 00	10 00	7 00	1 75	1 50



Plate 942.

WESTON'S GEARED DIFFERENTIAL PULLEY BLOCK.

One man can lift from 2,000 to 5,000 pounds.

They hold the load at any point, and can not run down.

PRICE LIST OF GEARED BLOCKS.

Capacity	Price, Complete, with Chains, regular lengths, Boxed	CHAINS			Hoist. See Note.*	Net Weight, Complete
		Regular Lengths		Price, of extra Main Chain, per foot		
		Main Chain	Hand Chain			
1 ton.	\$ 35 00	22 ft.	16 ft.	\$0 40	8 ft.	62 lbs.
2 ton.	45 00	24 ft.	18 ft.	44	9 ft.	109 lbs.
3 ton.	60 00	26 ft.	20 ft.	48	10 ft.	159 lbs.
4 ton.	80 00	28 ft.	22 ft.	54	11 ft.	257 lbs.
5 ton.	110 00	30 ft.	24 ft.	60	12 ft.	324 lbs.
6 ton.	150 00	32 ft.	26 ft.	70	13 ft.	493 lbs.
8 ton.	210 00	36 ft.	28 ft.	85	14 ft.	735 lbs.
10 ton.	275 00	40 ft.	30 ft.	1 00	16 ft.	1054 lbs.

EXTRA LENGTHS OF CHAINS.

For each foot of extra hoist allow $2\frac{1}{4}$ feet of main chain and 2 feet of hand chain.

Extra Hand Chain, per foot \$0 38

*NOTE.—Figures in sixth column denote approximate height which blocks, with regular lengths of chain, will hoist from level on which operator stands.

PRICES OF GEARED PULLEY BLOCK PARTS.

Capacity	Sheaves		Hand Wheels	Capacity	Sheaves		Hand Wheels
	Top	Bottom			Top	Bottom	
1 ton.	\$3 00	\$1 25	\$1 00	5 ton.	\$11 00	\$4 50	\$4 00
2 ton.	3 75	1 75	1 00	6 ton.	14 00	6 50	4 00
3 ton.	5 00	2 50	2 00	8 ton.	22 00	9 00	5 00
4 ton.	8 00	3 50	3 00	10 ton.	30 00	12 00	5 00

Plate 943.

THE YALE DUPLEX CONVERTIBLE SCREW BLOCK.



Plate 944.

The latest addition to the line of Chain Blocks is intermediate in efficiency and price between the Differential and Triplex types, and is adapted to the widest range of uses.

As indicated by its name, Screw Block, the leverage by which the hoisting capacity is obtained is that of a screw or, more properly, a worm and worm wheel. The device by which the load is sustained, and which acts in conjunction with the worm, is capable of conversion at the will of the operator so that a dispatch lowering action may be obtained when so desired.

Capacity in Tons	Price Complete	Hoist*	Price Extra Hoist		Net Wt. in Lbs.
			First Foot	Additional Foot	
½	\$ 25 00	8	\$1 80	\$1 52	43
1	30 00	8	1 85	1 56	57
1½	40 00	8	1 95	1 60	76
2	55 00	9	2 00	1 64	110
3½	90 00	10	2 25	1 88	210
5	140 00	12	2 40	2 00	340
7	175 00	12	3 55	2 96	378
10	260 00	12	3 85	3 20	570

* NOTE.—Figures denote height in feet which blocks, with regular lengths of Chain, will hoist from level on which operator stands.

THE YALE-WESTON TRIPLEX BLOCKS.

DIRECT FORM WITHOUT LOWER BLOCK.



Plate 945.

TYPE A WITH ONE UPPER HOOK.



Plate 946.

DIRECT FORM.

Capacity in Tons	$\frac{1}{2}$	1	$1\frac{1}{2}$	2
Complete	\$30 00	40 00	50 00	60 00
Hoist in Feet	8	8	8	9
Extra Hoist, First Foot	1 90	2 05	2 25	2 50
Extra Hoist, Additional Foot	1 20	1 30	1 40	1 50
Net Weight in Lbs.	55	90	120	150

TYPE A-COMBINATION.

Capacity in Tons	3	4	5	6	8	10
Complete	\$80 00	100 00	125 00	150 00	180 00	225 00
Hoist in Feet	10	10	12	12	12	12
Extra Hoist, First Foot	2 80	3 15	3 60	4 15	4 80	5 50
Extra Hoist, Additional Foot	1 70	1 95	2 25	2 60	3 00	3 45
Net Weight in Lbs	206	307	397	417	505	622

HARRINGTON'S DOUBLE CHAIN SCREW HOISTING MACHINE.

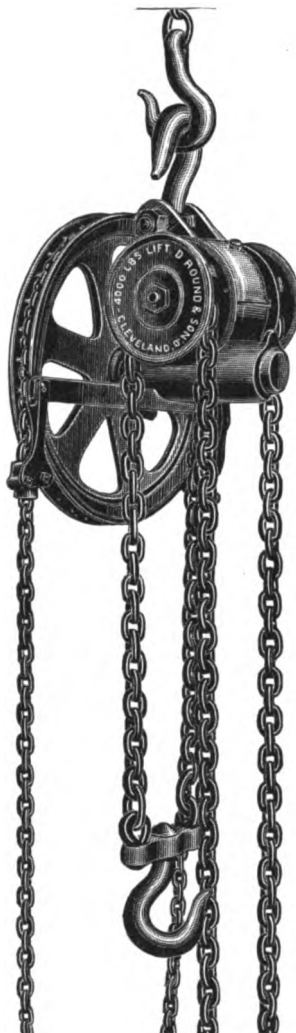


Plate 947.

In ordering chains, allow four feet of chain to each foot of lift.

		Price	Extra Lift per ft
Weight of Machine	35 lbs., Lift 8 feet, to raise 500 lbs.	\$22 50	\$1 00
Weight of Machine	52 lbs., Lift 8 feet, to raise 1,000 lbs.	25 00	1 20
Weight of Machine	65 lbs., Lift 8 feet, to raise 2,000 lbs.	30 00	1 50
Weight of Machine	76 lbs., Lift 8 feet, to raise 3,000 lbs.	40 00	1 75
Weight of Machine	140 lbs., Lift 9 feet, to raise 4,000 lbs.	50 00	2 00
Weight of Machine	226 lbs., Lift 10 feet, to raise 6,000 lbs.	75 00	2 20
Weight of Machine	258 lbs., Lift 10 feet, to raise 8,000 lbs.	95 00	2 40
Weight of Machine	625 lbs., Lift 12 feet, to raise 10,000 lbs.	140 00	3 00
Weight of Machine	750 lbs., Lift 12 feet, to raise 12,000 lbs.	180 00	3 75
Weight of Machine	875 lbs., Lift 12 feet, to raise 16,000 lbs.	260 00	4 75
Weight of Machine	925 lbs., Lift 12 feet, to raise 20,000 lbs.	340 00	6 00

These hoists are everywhere recognized as the standard. Adopted by the United States Government, and in use in all first-class shops, rolling mills and manufactories.

For heavy weights they have no equal.

They are safer and more durable than any other hoists. They have independent working chains, and the load being carried by two distinct chains, instead of one, the possibility of accident is greatly reduced. On the smaller sizes, 35 lbs. lifts 1,000 lbs., and more on the larger ones.

THE YALE-WESTON DOUBLE LIFT HOIST.

DOUBLE LIFT, WITH LENGTHENED SHAFT, FOR USE OVER HATCHWAYS.

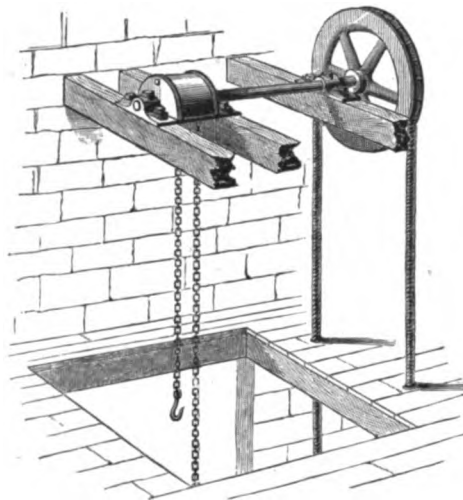


Plate 948.

This device is particularly adapted for the quick handling of light yet bulky loads, work over hatchways, etc.

Capacity in lbs.		Price Complete (except Hand rope or Chain)		Hoist		Price For Extra Hoist, per Foot		Hand-Rope or Chain Extra				Distance from Cen- ter of Rope Wheel to Center of Chain Sheave
								Rope		Chain		
500	..	\$25 00	..	16 feet	..	\$0 40	..	\$3 00	..	\$5 00	..	4 $\frac{9}{16}$ in.
1,000	..	50 00	..	24 feet	..	44	..	4 00	..	7 00	..	8 $\frac{5}{8}$ in.
1,500	..	65 00	..	28 feet	..	48	..	4 50	..	8 00	..	9 $\frac{1}{8}$ in.
2,000	..	80 00	..	32 feet	..	52	..	5 00	..	9 00	..	10 $\frac{1}{8}$ in.

With the five hundred pound size one man can lift the full capacity at a speed of about 12 feet per minute and lighter loads at a correspondingly increased speed.

As its name implies, the Double Lift consists of a chain (with hook on either end) passing over a sheave, which can be rotated by the hand-rope and wheel. Pulling one side of rope causes opposite side of chain to rise with load. In descending the load moves only as long as the rope is pulled, being controlled by the Weston Automatic Safety Brake.

DERRICK WINCHES AND CRABS.

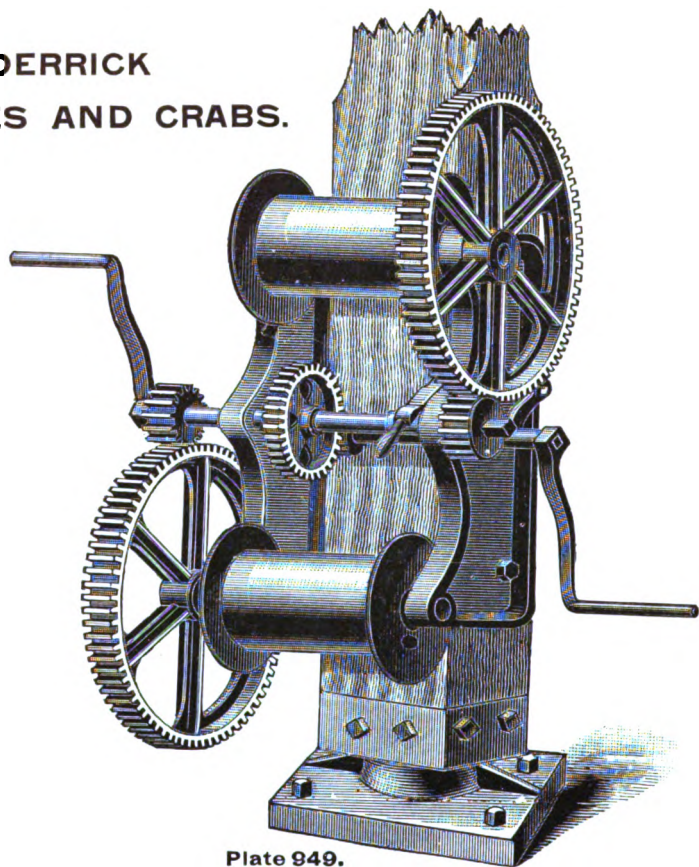


Plate 949.

DERRICK WINCH. DOUBLE DRUM. DOUBLE PURCHASE.

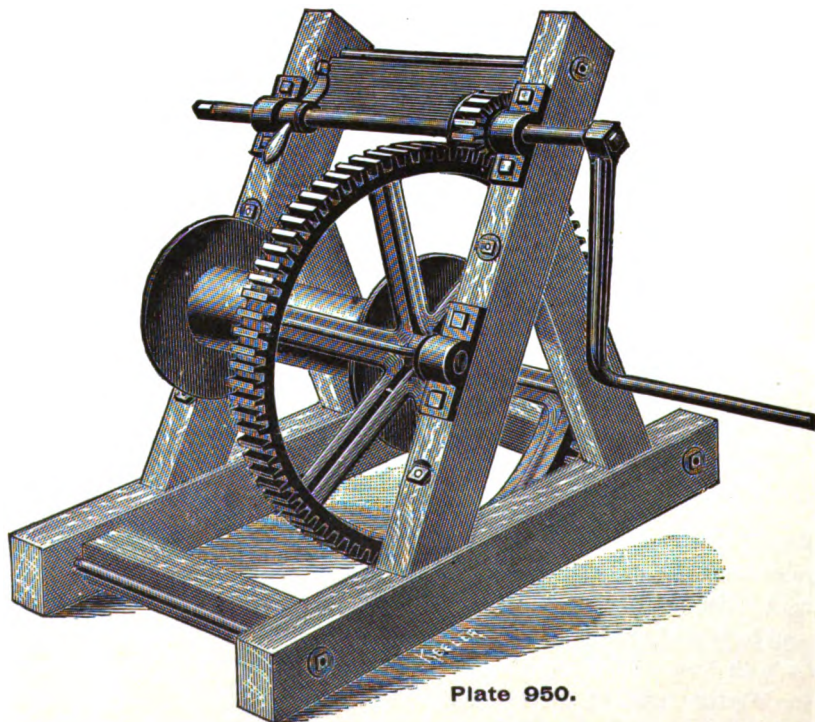


Plate 950.

HAND POWER CRAB. SINGLE DRUM. SINGLE PURCHASE. CAPACITY, 5 TONS.

A large assortment of sizes and kinds. Write us for particulars, stating what you want.

HORSE POWER HOISTING MACHINERY.

NO. 3 HORSE POWER HOISTING MACHINE.

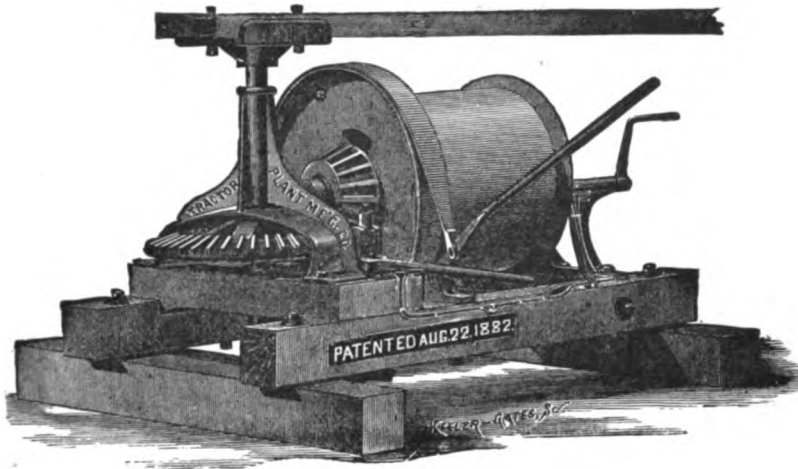


Plate 951.

SINGLE DRUM.

Designed for elevating brick and mortar in hods or wheelbarrows in the construction of chimneys, towers or high buildings.

CAPACITY.

Single line, 960 lbs, 55 feet per minute; single block, 1,920 lbs. 28 feet per minute.

DIMENSIONS.

Gears, 45 and 18 teeth. Drum, 21 inches long by 20 inches in diameter. Bed frame, 5 feet 3 inches by 3 feet 3 inches wide. Height, 3 feet 6 inches. Weight, 1,200 lbs.

The No. 3 machine is single geared.

NO. 4 HORSE POWER HOISTING MACHINE.

SINGLE DRUM, DOUBLE SPEED.

Designed for the use of builders and quarrymen.

CAPACITY.

Fast Speed—Single Rope, 960 lbs. 55 feet per minute; single block, 1,920 lbs., 28 feet per minute.

Slow Speed—Single rope, 2,400 lbs., 22 feet per minute; single block, 4,800 lbs., 11 feet per minute; two single blocks, 7,200 lbs.

DIMENSIONS.

Gears, 42 and 42, 45 and 18 teeth. Drum, 22 inches long, by 20 inches diameter. Bed frame, 6 feet long by 3 feet 3 inches wide. Height, 4 feet. Weight, 1,800 lbs.

DIRECTIONS.

To raise the weight, start the horse and draw back one gear lever. To lower, push forward gear lever and in the same instant apply the brake and lower the weight to place desired. To ensure safety, change of speed should only be done when there is no load on the machine. To take up slack rope, use crank on end of drum. Care should be taken to have gear wheels kept properly in gear. To put wheels closer in gear, tighten nuts connected with bridge trees and adjust collar on outer end of drum.

HORSE POWER HOISTING MACHINERY.

No. 2 HORSE POWER HOISTING MACHINE.

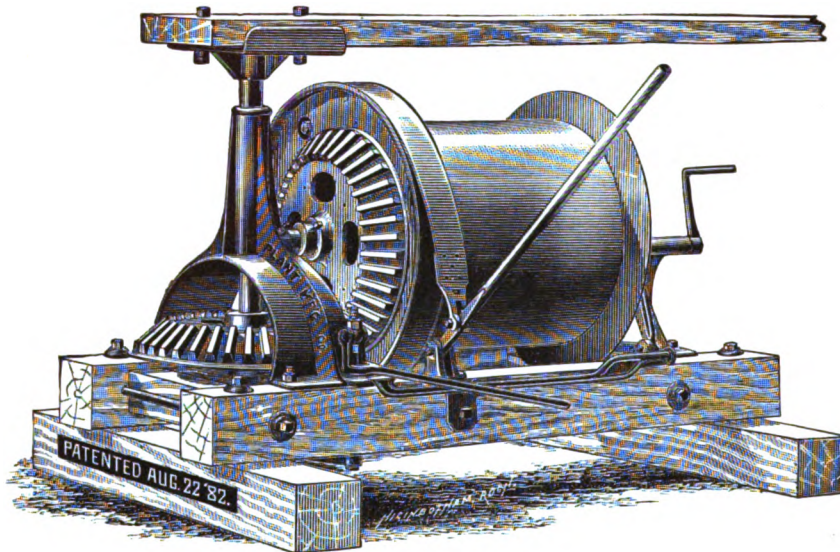


Plate 952.

SINGLE DRUM.

Designed for the ordinary building of bridge foundations and approaches, and quarrying.

CAPACITY.

Single rope, 2,400 pounds 22 feet per minute. Single block, 4,800 pounds 11 feet per minute. Two single blocks, 7,200 pounds.

DIMENSIONS.

Gears, 34 and 34 teeth. Drum, 22 inches long by 20 inches diameter. Bed frame, 5 feet 3 inches long by 2 feet 9 inches wide. Height, 3 feet 6 inches. Weight, 1,200 pounds.

No. 1½ HORSE POWER HOISTING MACHINE.

SINGLE DRUM.

DESIGNED FOR HEAVY WORK, QUARRYING OR BUILDING.

CAPACITY.

Single rope, 4,800 pounds 11 feet per minute. Single block, 9,600 pounds 5½ feet per minute. Two single blocks, 14,400 pounds.

DIMENSIONS.

Gears, 20 and 43 teeth. Drum, 22 inches long by 20 inches diameter. Bed frame, 5 feet 3 inches by 2 feet 9 inches wide. Weight, 1,400 pounds.

No. 2½ HORSE POWER HOISTING MACHINE.

SINGLE DRUM.

Designed for light lifting, such as slate, coal, etc.

CAPACITY.

Single rope, 1,600 pounds 33 feet per minute. Single block, 3,200 pounds 17 feet per minute.

DIMENSIONS.

Gears, 39 and 26 teeth. Drum, 22 inches long by 20 inches diameter. Bed frame, 5 feet 3 inches by 3 feet wide. Height, 3 feet 6 inches. Weight, 1,200 pounds.

DIRECTIONS.

To raise weight, start the horse and draw back gear lever. To lower, push forward gear lever and in the same instant apply brake and lower weight to place desired. To take up slack rope, use the crank on end of drum. Care should be taken to have gear wheels kept close in gear. To put wheels closer in gear, tighten two nuts connected with iron bridge tree, and adjust collar on outer end of drum.

No. 26 HAND POWER BREAST DERRICK.

DOUBLE DRUM.

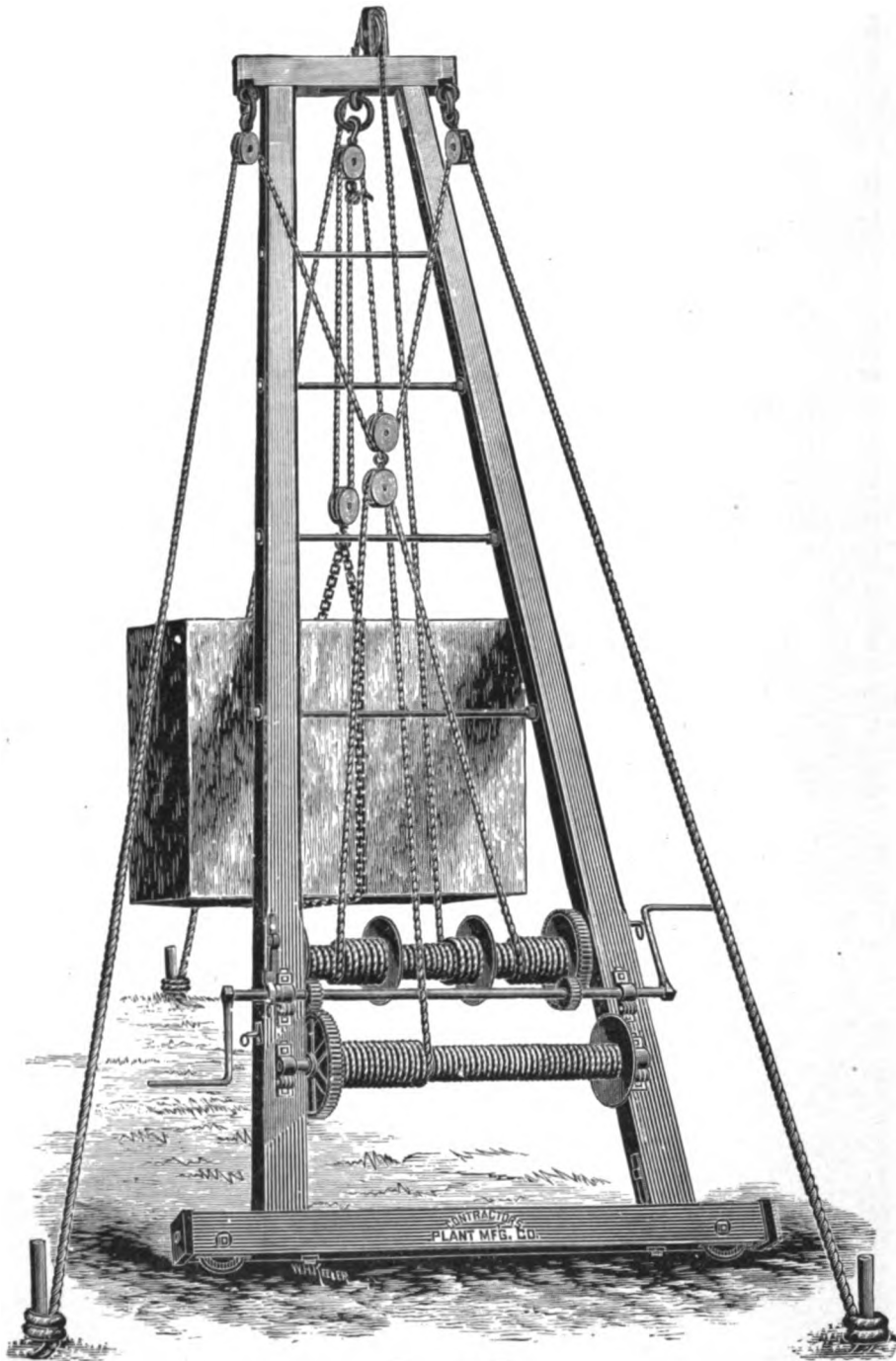


Plate 953.

We have a large variety of Derricks. Write us, stating kind and capacity you want.

CROOK'S HOISTING ENGINES.

THE FOLLOWING ARE A FEW OF THE
MANY DIFFERENT KINDS OF EN-
GINES WE CAN FURNISH FOR
HOISTING PURPOSES:

SINGLE AND DOUBLE CYLINDERS WITH
SINGLE OR DOUBLE DRUMS, WITH OR
WITHOUT BOILERS.

BRIDGE CONSTRUCTING ENGINES, 4, 6
AND 8 SPOOL, SELF-PROPELLING,
MOUNTED ON TRUCKS.

PORTABLE HOISTING ENGINE ON LARGE
TRUCKS.

SPROCKET WHEEL ENGINES.

DOUBLE END HOISTERS.

DREDGING ENGINES, SELF-PROPELLING.

COMPOUND GEARED LOG HOISTING
ENGINES.

COAL HOISTERS.

CONVEYING ENGINES.

TAIL ROPE HAULING ENGINES.

QUARRY HOISTS.

DRAW BRIDGE ENGINES.

ELECTRIC HOISTS.

MINING HOISTING ENGINES, ETC., ETC.

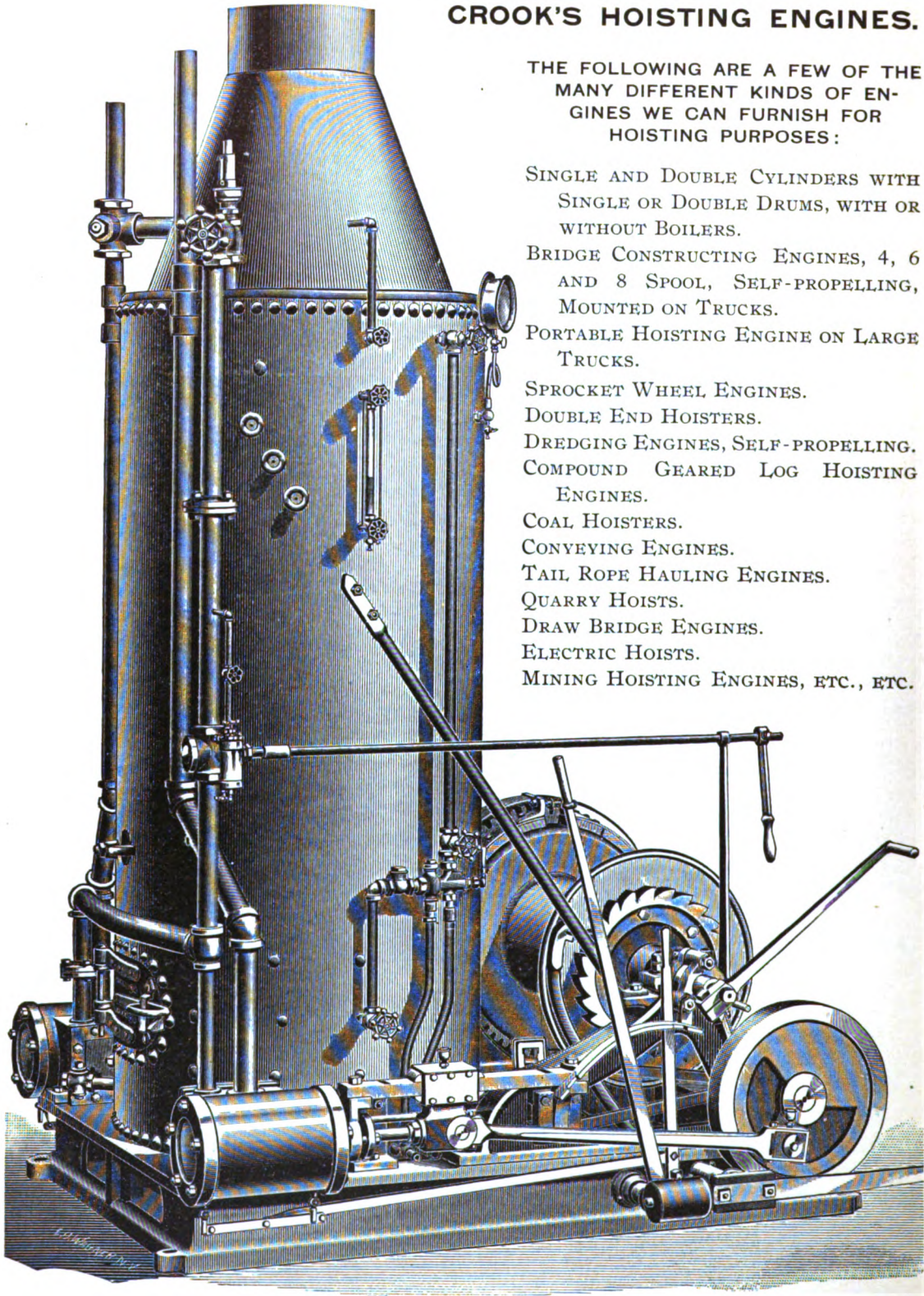


Plate 954.

We furnish Hoisting Engines for all purposes. Send for Special Catalogue.

DOUBLE CYLINDER, DOUBLE PATENT FRICTION DRUM, DOUBLE WINCH HOISTING ENGINE.

WITH OR WITHOUT FOOT BRAKES, AND WITHOUT BOILER.

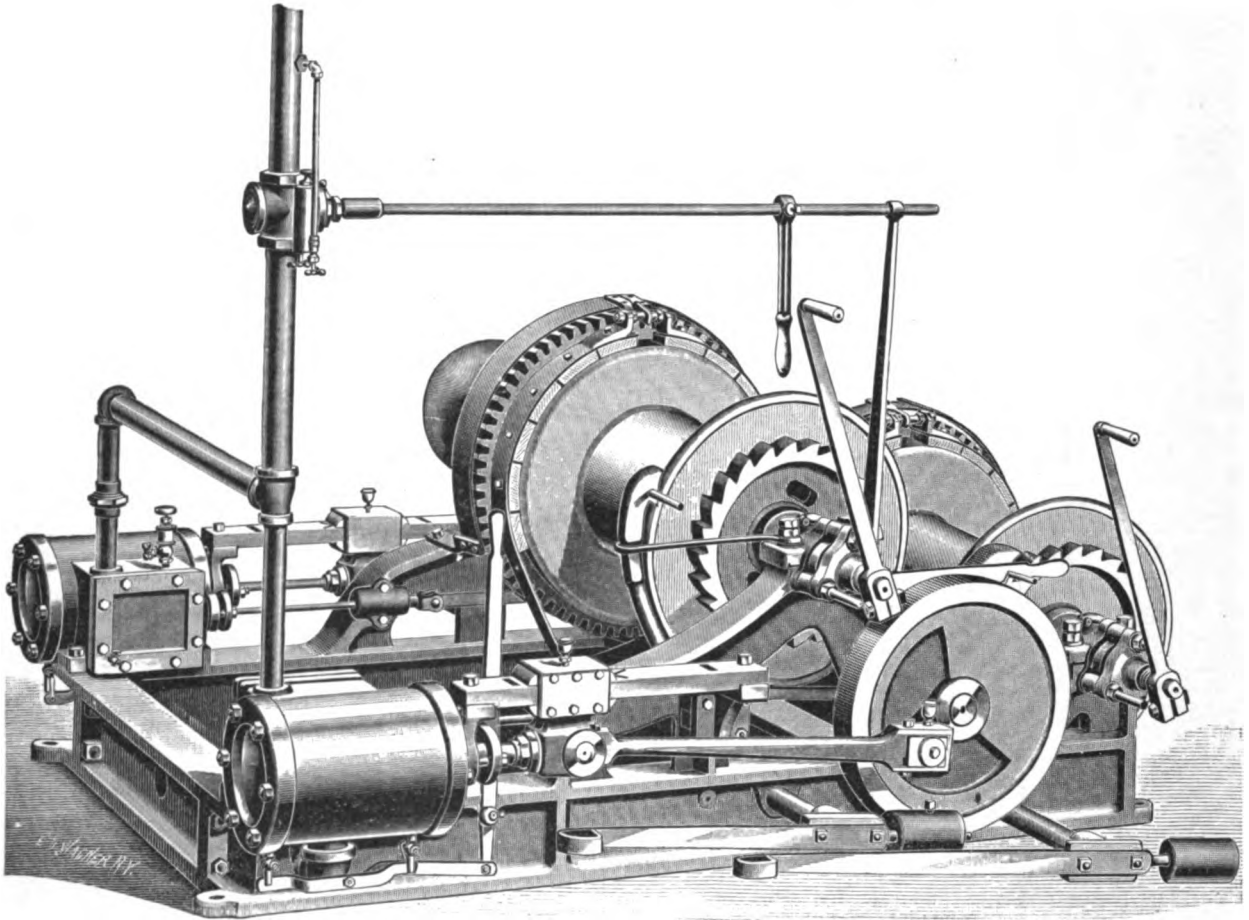
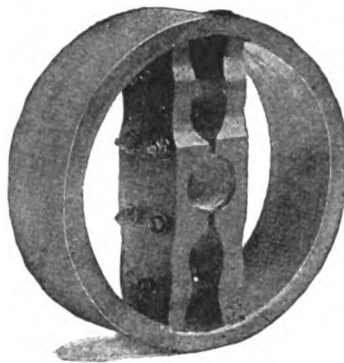
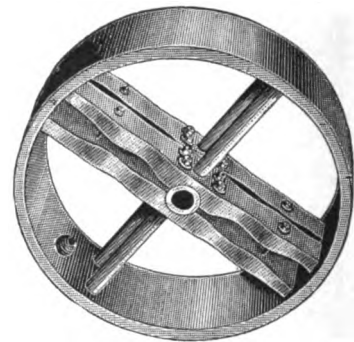


Plate 955.

Specially adapted for Quarries, Bridge Builders, Contractors, Lighters, Railroads, etc.

The above engraving represents our regular Double Cylinder, Double Friction Drum, Double Winch Hoisting Engine, with ratchets and pawls. It is without a boiler, and is adapted to uses where steam is furnished from an independent boiler. One drum is entirely independent of the other; the load can be hoisted or lowered on one or both drums at the same time, or left suspended with the pawls while the engine is run to operate the winch-head or one of the drums.

Size No. of Engine	Horse Power	Cylinders		Will Hoist with Single Line, in Pounds	Diam. of Drum, Inches	Suitable Weight of Pile-Driving Hammer, Lbs.	Estimated Shipping Weight, Pounds	Price Complete	Price Complete with Foot Brakes	Price Extra for Dock Wheels
		Diam., Inches	Stroke, Inches							
160	10	5½	8	2500	12	1800	4000	\$ 650 00	\$ 700 00	\$ 40 00
161	14	6½	10	2800	14	2200	4300	725 00	775 00	40 00
162	20	7	10	5000	14	3500	5800	825 00	875 00	45 00
163	25	7½	10	6000	14	4000	6000	900 00	950 00	45 00
164	32	8½	10	8500	14	6200	6300	950 00	1000 00	50 00
165	40	8½	12	10000	20	8000	10500	1550 00	1625 00	60 00
166	50	9½	14	12000	20	10000	11500	1600 00	1675 00	75 00
167	55	10½	12	15000	22	12000	13000	1650 00	1725 00	100 00
168	60	10½	14	16000	24	14000	15000	1800 00	1900 00	125 00

MENASHA HICKORY SPLIT PULLEYS.**Plate 956.****Plate 957.****Plate 958.****SMALL HARD MAPLE SPLIT PULLEYS.**
Any Size Hole Wanted.

Diameter, in.	Face, 2 in.	3	4	5	6	7	8	9	10	11	12	13
3	\$2 00	\$2 20	\$2 40	\$2 60	\$2 80	\$3 00	\$3 25	\$3 50	\$3 75	\$4 00	\$4 35	\$4 70
4	2 00	2 25	2 50	2 75	3 00	3 25	3 60	3 90	4 25	4 50	4 80	5 10
5	2 10	2 35	2 65	3 00	3 25	3 60	3 85	4 15	4 40	4 70	5 10	5 50
6	2 20	2 50	2 85	3 20	3 55	3 90	4 25	4 45	5 00	5 50	6 00	6 50
7	2 30	2 60	2 90	3 30	3 70	4 20	4 70	5 25	5 75	6 25	6 60	7 20
8	2 40	2 70	3 00	3 45	3 90	4 40	4 95	5 50	6 00	6 60	7 25	7 75

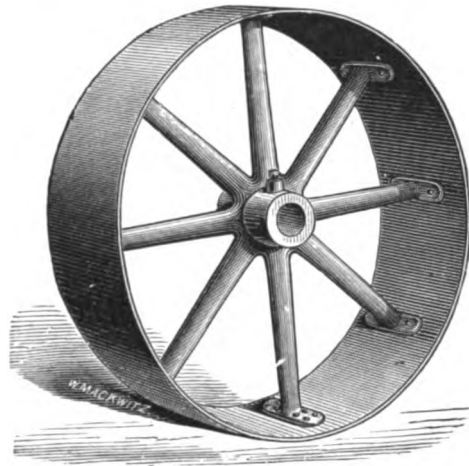
MENASHA HARDWOOD BENT RIM SPLIT PULLEYS.

No Extra Price for Split Pulley.

Diam., in.	Face 3 in.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	20	21	22
9	\$2 50	\$2 65	\$2 90	\$3 15	\$3 28	\$3 49	\$3 65	\$3 75	\$4 00	\$4 20	\$4 40	\$4 70	\$5 10	\$5 60	\$6 00	\$6 30	\$6 60	\$6 90	\$7 20
10	2 60	2 75	3 00	3 25	3 40	3 59	3 72	3 90	4 20	4 40	4 70	5 10	5 60	6 00	6 30	6 60	7 20	7 55	7 90
11	2 70	2 85	3 10	3 35	3 53	3 70	3 90	4 10	4 40	4 70	5 10	5 60	6 00	6 30	6 60	7 20	7 70	8 00	8 30
12	2 80	2 95	3 20	3 55	3 70	3 85	4 08	4 30	4 70	5 10	5 60	6 00	6 30	6 60	7 20	7 70	8 35	8 75	9 05
13	2 90	3 10	3 40	3 75	4 00	4 25	4 53	4 80	5 20	5 60	6 00	6 30	6 60	7 20	7 70	8 35	9 05	9 50	9 90
14	3 00	3 25	3 65	4 10	4 40	4 70	5 02	5 35	5 68	6 00	6 30	6 60	7 20	7 70	8 35	9 05	9 90	10 50	10 70
15	3 10	3 45	3 85	4 35	4 75	5 10	5 48	5 85	6 18	6 50	6 84	7 20	7 70	8 35	9 05	9 90	10 70	11 25	11 70
16	3 30	3 65	4 05	4 60	5 05	5 50	5 90	6 30	6 65	7 00	7 35	7 70	8 35	9 05	9 90	10 70	11 70	12 00	13 00
17	3 50	3 85	4 25	4 85	5 35	5 85	6 30	6 70	7 10	7 50	7 88	8 25	9 05	9 90	10 70	11 70	13 00	13 50	13 80
18	3 70	4 05	4 55	5 10	5 65	6 20	6 65	7 10	7 55	8 00	8 50	9 00	9 80	10 70	11 75	13 00	13 80	14 50	14 70
19	3 80	4 25	4 80	5 50	6 13	6 75	7 15	7 50	8 05	8 60	9 20	9 80	10 70	11 70	12 75	13 80	14 70	15 50	15 80
20	4 10	4 45	5 20	6 00	6 60	7 15	7 66	8 00	8 75	9 50	10 25	11 00	11 80	12 60	13 60	14 70	15 80	16 00	17 00
21	4 40	4 70	5 60	6 40	6 95	7 50	8 10	8 65	9 55	10 40	11 20	12 00	12 85	13 70	14 70	15 80	17 00	17 50	17 80
22	4 70	4 95	5 90	6 85	7 45	8 00	8 70	9 40	10 30	11 20	12 10	13 00	13 60	14 20	15 60	17 00	17 50	19 00	20 00
23	5 00	5 20	6 15	7 05	7 70	8 40	9 20	9 95	11 05	12 00	13 00	14 00	15 10	16 20	17 00	18 50	20 00	25 00	28 50
24	5 30	5 40	6 35	7 30	8 05	8 80	9 65	10 45	11 55	12 70	13 90	15 10	16 30	17 50	18 75	20 00	28 50	30 50	32 50
25	5 70	5 80	6 65	7 60	8 40	9 20	9 85	10 90	12 15	13 40	14 80	16 25	17 70	19 10	20 65	22 00	30 00	32 00	34 00
26	6 00	6 35	7 00	7 95	8 80	9 60	10 05	11 40	12 80	14 20	15 85	17 50	19 15	20 80	22 45	24 10	31 50	33 50	35 50
27	6 40	6 78	7 40	8 27	9 13	9 95	10 63	11 75	13 25	14 72	16 47	18 25	20 17	21 90	23 70	25 50	32 25	34 25	36 25
28	6 80	7 20	7 80	8 60	9 45	10 30	11 20	12 10	13 70	15 25	17 10	19 00	21 00	23 00	24 95	26 90	33 00	35 00	37 00
29	7 20	7 60	8 20	9 00	9 95	10 90	11 80	12 67	14 20	15 87	17 92	20 00	22 10	24 20	26 32	28 45	33 75	35 62	37 62
30	7 60	8 00	8 60	9 40	10 45	11 50	12 40	13 25	14 90	16 50	18 75	21 00	23 20	25 40	27 70	30 00	34 50	36 25	38 25
31	8 00	8 40	9 00	9 85	11 02	12 20	13 17	14 13	15 68	17 20	19 52	21 87	24 22	26 55	28 85	31 12	35 37	37 25	39 25
32	8 40	8 80	9 40	10 30	11 60	12 90	13 95	15 00	16 45	17 90	20 30	22 75	25 25	27 75	30 00	32 25	36 25	38 25	40 25
33	8 80	9 20	9 95	10 90	12 30	13 70	14 85	16 00	17 47	18 95	21 45	23 62	26 25	28 87	31 12	33 37	37 00	39 50	41 50
34	9 20	9 60	10 50	11 50	13 00	14 50	15 75	17 00	18 50	20 00	22 50	24 50	27 25	30 00	32 25	34 50	38 75	40 75	42 75
35	9 60	10 10	11 20	12 25	13 75	15 25	16 65	18 05	19 62	21 00	23 50	25 50	28 35	31 20	33 47	35 75	40 12	42 12	44 12
36	10 10	10 60	11 90	13 00	14 50	16 00	17 55	19 10	20 80	22 50	24 50	26 50	29 45	32 40	34 70	37 00	41 50	43 00	45 55
38	10 60	11 10	12 40	14 50	16 05	17 60	19 15	20 70	22 70	24 75	26 60	28 50	31 50	34 50	36 90	39 25	45 00	47 00	49 00
40	11 10	12 00	14 00	16 00	17 50	19 00	20 75	22 50	24 67	26 75	28 85	31 00	33 65	36 25	38 85	41 50	48 00	50 50	52 50
42	12 10	14 00	14 80	17 50	19 50	21 50	23 25	25 00	27 00	29 00	31 25	33 50	36 00	38 50	41 10	43 75	51 00	53 50	56 00
44	14 10	16 00	17 50	19 50	21 65	23 75	25 65	27 50	29 50	31 50	33 75	36 00	38 40	40 75	43 35	46 00	54 00	56 50	59 00
46	16 10	18 00	20 00	22 00	24 00	26 00	28 00	30 00	31 75	33 50	36 00	38 50	40 75	43 00	45 50	48 00	58 00	61 00	64 00
48	18 00	20 00	22 00	24 50	26 25	28 00	30 50	32 50	34 25	36 00	38 50	41 00	43 00	45 00	47 50	50 00	62 00	66 75	71 50
50	20 00	22 00	24 50	26 60	30 00	31 50	33 50	35 50	37 25	39 00	41 50	44 00	47 00	50 00	53 00	56 00	65 00	69 75	74 50
52	.....	24 50	26 25	28 00	31 50	34 00	36 00	38 00	40 00	42 00	44 00	46 00	49 50	52 50	56 50	60 00	68 00	72 50	77 00
54	.....	.....	28 00	31 50	34 00	37 50	39 25	41 00	43 00	45 00	47 25	49 50	52 50	55 50	60 00	64 50	73 50	78 25	83 00
56	.....	.....	.....	34 00	37 50	40 50	42 50	44 50	46 50	48 50	51 00	53 50	56 75	60 00	63 75	69 50	84 00	88 50	93 25
58	.....	.....	.....	40 50	42 50	43 50	46 00	47 50	50 00	52 25	55 00	57 75	61 00	64 25	68 50	73 75	87 50	90 50	95 25
60	.....	.....	.....	43 00	45 00	47 00	49 25	51 50	53 75	56 00	59 00	62 00	65 25	68 50	73 25	78 00	91 00	96 00	101 00
62	.....	.....	.....	.....	49 00	51 25	53 50	55 75	58 00	61 00	64 00	67 25	70 50	75 25	80 00	85 00	98 00	103 00	109 00
64	.....	.....	.....	.....	50 50	53 00	55 25	58 00	60 75	64 25	67 75	71 25	75 25	79 25	84 50	90 00	103 00	108 00	115 00
66	.....	.....	.....	.....	52 00	54 50	57 00	60 00	63 50	67 50	71 50	75 50	80 00	84 50	89 00	94 00	108 00	111 00	117 00
68	.....	.....	.....	.....	54 00	56 50	59 00	62 00	65 50	69 50	73 50	77 50	82 00	86 50	91 00	96 00	110 00	115 00	122 00
70	.....	.....	.....	.....	57 00	59 00	61 00	64 50	68 00	72 50	76 50	80 00	84 00	88 00	92 00	97 00	112 00	124 00	128 00
72	.....	.....	.....	.....	60 00	62 00	64 00	67 50	71 50	75 50	79 00	83 00	87 00	91 00	95 00	100 00	115 00	127 00	131 00
74	.....	.....	.....	.....	.....	.....	89 00	92 00	95 00	99 00	104 00	109 00	114 00	119 00	124 00	130 00	140 00	146 00	150 00
76	.....	.....	.....	.....	.....	.....	104 00	107 00	110 00	114 00	119 00	124 00	129 00	134 00	139 00	145 00	154 00	162 00	170 00
78	.....	.....	.....	.....	.....	.....	117 00	121 00	125 00	129 00	134 00	139 00	144 00	149 00	154 00	160 00	174 00	183 00	192 00
80	.....	.....	.....	.....	.....	.....	132 00	136 00	140 00	145 00	150 00	155 00	160 00	165 00	170 00	175 00	192 00	202 00	212 00

WROUGHT IRON RIM PULLEYS.

Prices of Pulleys of larger dimensions than listed furnished on application.
Pulleys of intermediate sizes at proportionate prices.

**Plate 959.****WHOLE, SPLIT, TIGHT AND LOOSE.**

For additional prices for Split, Tight and Loose Pulleys, see page 391.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price																
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt															
8	3	\$ 2 95	\$ 3 30	12	9	\$ 5 35	\$ 6 50	16	3	\$ 4 15	\$ 5 05	19	3	\$ 4 80	\$ 5 75															
	4	3 15	3 55		10	5 70	7 00		4	4 45	5 40		4	5 20	6 20															
	5	3 40	3 80		11	6 15	7 50		5	4 80	5 75		5	5 65	6 65															
	6	3 70	4 20		12	6 70	8 00		6	5 15	6 20		6	6 05	7 10															
	7	4 00	4 60		13	3	7		5 50	6 65	7		6 45	7 55																
	8	4 30	4 95				8		5 90	7 15	8		6 95	8 30																
9	3	3 00	3 45	13	4	3 85	4 65	17	9	6 30	7 65	20	9	7 45	9 00															
	4	3 25	3 70		5	4 15	5 00		10	6 70	8 15		10	8 00	9 75															
	5	3 50	3 95		6	4 50	5 40		11	7 20	8 65		11	8 55	10 50															
	6	3 80	4 35		7	4 85	5 80		12	7 70	9 15		12	9 10	11 30															
	7	4 10	4 80		8	5 20	6 20		14	8 95	10 45		14	10 40	13 10															
	8	4 40	5 10		9	5 55	6 65		16	10 25	11 90		16	11 80	14 90															
10	3	3 10	3 55	14	10	6 00	7 15	17	3	4 35	5 30	20	18	13 90	17 00															
	4	3 35	3 85		11	6 50	7 65		4	4 65	5 65		3	4 95	5 95															
	5	3 60	4 15		12	7 00	8 25		5	5 00	6 00		4	5 35	6 40															
	6	3 90	4 50		15	3	6		5 35	6 35	5		5 80	7 15																
	7	4 20	5 00				7		5 75	6 80	6		6 25	7 90																
	8	4 50	5 30				8		6 15	7 30	7		6 70	8 65																
9	4 80	5 65	9	6 65			7 80	8	7 15	9 40																				
10	5 15	6 00	10	7 00			8 30	9	7 65	10 15																				
11	3	3 25	3 80	15			11	6 80	8 05	18	11	7 50	8 80	21	10	8 15	10 90													
	4	3 55	4 15		12	7 35	8 55	12	8 00		9 30	11	8 70		11 65															
	5	3 85	4 55		14	8 35	9 85	14	9 25		10 80	12	9 25		12 40															
	6	4 20	4 95		16	3	4 55	5 50	16		10 60	12 30	14		10 65	14 00														
	7	4 55	5 35						18		12 30	14 35	16		12 15	15 90														
	8	4 90	5 80						4		4 85	5 85	18		14 35	17 80														
9	5 25	6 20	5	5 25					6 25	20	16 70	19 90																		
10	5 60	6 60	6	5 65					6 65	21	3	5 10	6 15																	
12	3	3 40	4 05	16					3		4 85	5 85	5	6 05	7 10	6	6 40	8 20												
	4	3 70	4 40		17	3	4 95	5 95											7 40											
	5	4 00	4 75																	18	3	5 10	6 10							
	6	4 30	5 10																					19	3	5 25	6 25			
	7	4 65	5 55																									20	3	5 40	6 40
	8	5 00	6 00							21																						3	5 55	6 55

WROUGHT IRON RIM PULLEYS.—CONTINUED.

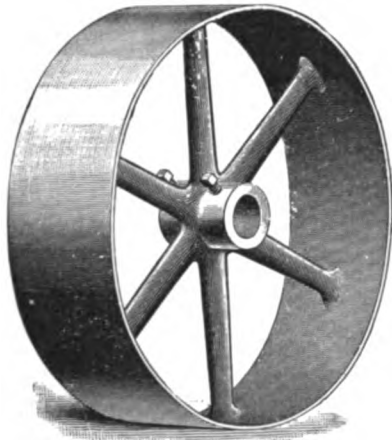
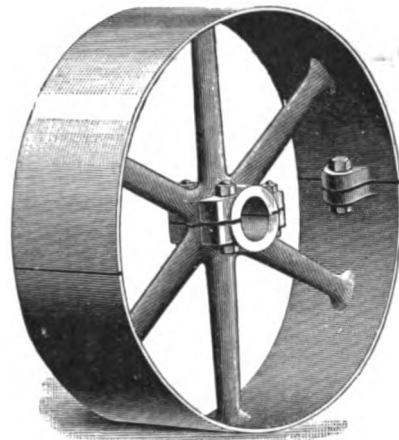
Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price	
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt
21	16	\$13 00	\$17 00	26	3	\$ 6 70	\$ 7 60	29	22	\$30 00	\$32 90	33	5	\$ 9 70	\$10 65
	18	15 35	19 00		4	7 05	8 10		24	33 80	36 70		6	10 70	11 75
	20	17 70	21 00		5	7 60	8 95		26	.....	40 60		7	11 80	13 30
22	3	5 25	6 35	27	6	8 50	9 95	30	28	.....	44 50	34	8	12 90	14 60
	4	5 65	6 80		7	9 45	10 95		30	.....	48 25		9	14 00	16 00
	5	6 10	7 65		8	10 40	12 00		3	7 70	8 45		10	15 10	17 40
23	6	6 55	8 50	28	9	11 30	12 95	31	4	8 10	8 95	35	11	16 40	18 85
	7	7 00	9 35		10	12 25	13 85		5	8 95	9 85		12	17 75	20 30
	8	7 45	10 20		11	13 20	14 90		6	9 80	10 85		14	21 50	24 00
24	9	8 00	11 05	29	12	14 10	15 95	32	7	10 75	12 10	36	16	24 35	27 00
	10	8 55	11 90		14	16 30	18 25		8	11 85	13 30		18	28 15	30 80
	11	9 10	12 75		16	18 70	20 65		9	12 85	14 65		20	32 00	34 70
25	12	9 65	13 60	30	18	21 10	23 05	33	10	13 90	15 90	37	22	35 90	39 50
	14	11 75	15 80		20	23 60	25 60		11	15 00	17 20		24	39 70	43 40
	16	14 00	18 05		22	26 40	28 50		12	16 10	18 55		26	43 50	47 20
26	18	16 35	20 30	31	24	29 60	31 70	34	14	18 75	21 20	38	28	47 30	51 10
	20	18 70	22 65		26	.....	34 90		16	21 50	24 20		30	51 10	56 00
					3	6 90	7 75		18	24 30	27 10	39			
27	3	5 40	6 55	32	4	7 30	8 25	35	20	27 50	30 60		3	8 55	9 35
	4	5 80	7 00		5	7 90	9 19		22	31 00	35 00		4	9 00	9 85
	5	6 25	7 85		6	8 85	10 10		24	34 50	38 50	40	5	10 00	10 90
28	6	6 70	8 70	33	7	9 80	11 30	36	26	38 20	42 20		6	11 00	12 05
	7	7 15	9 55		8	10 75	12 50		28	42 00	46 00		7	12 20	13 40
	8	7 60	10 40		9	11 70	13 50	37	30	46 00	50 00	41	8	13 35	15 05
29	9	8 15	11 25	34	10	12 70	14 50	38	3	7 90	8 70		9	14 45	16 55
	10	8 75	12 10		11	13 70	15 50		4	8 35	9 15		10	15 50	18 00
	11	9 35	12 95		12	14 60	16 50	39	5	9 20	10 10	42	11	16 90	19 55
30	12	9 95	13 80	35	14	16 90	19 00	40	6	10 10	11 15		12	18 30	21 00
	14	12 25	16 15		16	19 30	21 60		7	11 10	12 50		14	22 10	24 80
	16	15 30	18 55		18	21 60	23 90	41	8	12 10	14 00	43	16	25 90	28 60
31	18	17 50	20 95	36	20	24 50	26 80		9	13 10	15 35		18	29 70	32 40
	20	20 00	23 35		22	28 00	30 30		10	14 25	16 55	44	20	33 50	36 35
					24	31 50	33 80	42	11	15 45	17 75		22	38 30	41 60
32	3	5 60	6 80	37	26	.....	37 30	43	12	16 65	19 10		24	42 10	45 45
	4	6 00	7 20	38	3	7 20	8 00	44	14	19 70	22 15	45	26	45 90	49 70
	5	6 45	8 15		4	7 60	8 50		16	22 75	25 30		28	49 70	53 35
33	6	7 00	9 00	39	5	8 35	9 35	45	18	26 00	28 60	46	30	52 60	58 00
	7	7 50	9 90		6	9 30	10 35		20	29 25	31 85	47	3	8 80	9 65
	8	8 10	10 80		7	10 25	11 50	46	22	32 75	36 75		4	9 25	10 10
34	9	8 75	11 70	40	8	11 10	12 70		24	36 25	40 25		5	10 25	11 15
	10	9 40	12 60		9	12 05	13 85	47	26	39 75	43 75	48	6	11 30	12 35
	11	10 05	13 50		10	13 10	14 95		28	43 35	47 35		7	12 50	14 05
35	12	10 70	14 40	41	11	14 15	16 00	48	30	47 00	51 50	49	8	13 70	15 50
	14	13 10	16 80		12	15 15	17 15		3	8 15	8 95		9	14 90	17 35
	16	16 20	19 20		14	17 40	19 75	49	4	8 60	9 40	50	10	16 10	18 55
36	18	18 40	21 60	42	16	19 75	22 60		5	9 50	10 40		11	17 50	20 15
	20	20 90	24 00		18	22 60	25 50		6	10 40	11 45	51	12	18 95	21 75
	22	23 40	26 50		20	25 50	28 40	50	7	11 40	12 90		14	22 95	25 75
37	24	26 00	29 00	43	22	28 40	31 50		8	12 50	14 25		16	26 95	29 75
					24	32 20	35 30	51	9	13 50	15 55	52	18	31 00	33 80
					26	.....	39 10		10	14 60	16 85		20	35 00	37 80
38	3	6 30	7 30	44	3	7 45	8 20	52	11	15 90	18 30	53	22	39 00	43 00
	4	6 65	7 75		4	7 85	8 70		12	17 25	19 70		24	43 00	47 00
	5	7 30	8 70		5	8 65	9 60	53	14	20 60	23 05	54	26	47 00	51 00
39	6	8 05	9 60	45	6	9 55	10 55		16	24 00	26 50		28	51 00	55 00
	7	9 00	10 65		7	10 50	11 85		18	27 40	29 90	55	30	55 00	60 50
	8	9 80	11 75		8	11 45	13 10	54	20	30 80	33 30		3	9 05	9 90
40	9	10 35	12 45	46	9	12 40	14 20		22	34 40	38 00		4	9 50	10 35
	10	11 25	13 40		10	13 50	15 30	55	24	38 50	42 10	56	5	10 50	11 50
	11	12 30	14 40		11	14 55	16 50		26	41 60	45 20		6	11 60	12 70
41	12	13 40	15 50	47	12	15 60	17 85	56	28	45 25	48 85	57	7	12 80	14 25
	14	15 60	17 50		14	18 05	20 50		30	49 00	53 75		8	14 00	16 05
	16	17 90	19 80		16	20 65	23 45	57	3	8 35	9 15		9	15 25	17 70
42	18	20 20	22 10	48	18	23 20	26 00		4	8 80	9 65	58	10	16 45	19 25
	20	22 60	24 50		20	26 30	29 15						11	18 00	21 00
	22	25 20	27 10	49				58					12	19 60	22 50
43	24	27 80	30 00												
	26	.....	33 25												

WROUGHT IRON RIM PULLEYS.—CONTINUED.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt	
36	14	\$23 60	\$26 45	40	6	\$13 20	\$15 00	43	22	\$50 00	\$59 50	47	9	\$23 40	\$ 26 85	
	16	27 60	30 45		7	15 00	17 35		24	55 50	65 00		10	25 75	29 60	
	18	31 60	34 50		8	16 90	19 30		26	61 00	70 50		11	28 10	32 40	
	20	35 60	38 85		9	18 80	21 25		28	66 50	76 25		12	30 50	35 10	
	22	40 00	45 00		10	20 70	23 50		30	72 00	81 75		14	35 30	40 70	
	24	44 40	49 40		11	22 60	25 50		44	4	12 10		13 25	16	40 10	46 90
	26	48 80	53 80		12	24 50	27 70			5	13 75		15 10	18	45 60	52 50
	28	53 20	58 30		14	28 50	32 00			6	15 50		16 85	20	51 60	58 60
	30	57 60	63 70		16	32 50	36 90			7	17 35		19 30	22	57 00	66 50
	37	4	9 75		10 60	18	36 50			41 60	8		19 35	22 00	24	63 00	72 85
5		10 75	11 75	20	40 50	46 00	9	21 35		24 30	26	69 00	79 50			
6		11 90	13 05	22	45 50	53 75	10	23 40		26 80	28	75 00	85 50			
7		13 15	15 05	24	50 50	59 10	11	25 45		29 30	30	81 00	91 50			
8		14 50	16 65	26	55 50	64 40	12	27 50		31 65	48	4	13 60	14 70		
9		15 90	18 35	28	60 50	69 50	14	31 90		36 70		5	15 50	16 90		
10		17 35	20 00	30	65 50	75 20	16	36 50	42 50	6		17 50	19 00			
11		18 90	21 70	41	4	10 90	12 20	18	41 25	47 60		7	19 60	21 80		
12		20 45	23 55		5	12 30	13 75	20	46 25	52 60		8	21 70	24 80		
14		24 45	27 35		6	13 75	15 30	22	51 75	61 25		9	24 00	27 70		
16	28 45	31 35	7		15 60	17 85	24	57 25	66 85	10		26 40	30 55			
18	32 45	35 40	8		17 45	20 00	26	62 75	72 60	11		28 90	33 35			
20	36 45	39 65	9		19 40	22 00	28	68 25	78 10	12		31 50	36 25			
22	41 00	46 50	10		21 35	24 35	30	73 75	83 90	14		36 50	41 95			
24	45 50	50 80	11		23 30	26 40	45	4	12 45	13 55	16	41 50	48 05			
26	50 00	55 40	12		25 25	28 65		5	14 20	15 50	18	47 00	54 15			
28	54 50	60 25	14		29 25	34 60		6	16 05	17 40	20	52 50	60 35			
30	59 00	65 65	16	33 25	38 15	7		17 90	20 00	22	58 50	68 90				
38	4	10 00	10 90	18	37 25	43 15		8	19 90	22 80	24	64 50	74 95			
	5	11 10	12 15	20	41 75	47 65		9	21 95	25 25	26	70 50	81 10			
	6	12 25	13 50	22	46 75	55 00		10	24 15	27 70	28	76 50	87 10			
	7	13 65	15 50	24	52 25	61 00		11	26 40	30 45	30	82 50	95 35			
	8	15 10	17 20	26	67 75	66 50		12	28 65	32 85	50	6	19 00	22 30		
	9	16 55	19 00	28	63 25	72 00		14	33 05	38 10		7	20 70	25 20		
	10	18 00	20 85	30	68 75	78 00	16	37 65	44 10	8		23 00	28 10			
	11	19 65	22 50	42	4	11 35	12 55	18	42 65	49 30		9	25 40	31 30		
	12	21 30	24 50		5	12 80	14 10	20	48 15	54 90		10	28 15	34 70		
	14	25 30	28 50		6	14 35	15 95	22	53 65	63 25		11	30 95	38 20		
16	29 30	32 55	7		16 20	18 30	24	59 15	68 80	12		33 75	41 80			
18	33 30	36 70	8		18 05	20 60	26	64 65	74 50	14		39 40	48 50			
20	38 00	41 50	9		20 00	22 70	28	70 15	80 10	16		45 00	55 30			
22	42 70	48 00	10		22 00	25 20	30	75 65	86 00	18		50 65	62 20			
24	47 40	52 75	11		24 00	27 40	46	4	12 85	13 90	20	56 25	69 20			
26	52 10	57 45	12		26 00	29 50		5	14 70	15 95	22	62 90	76 40			
28	55 90	61 35	14		30 00	34 40		6	16 65	18 00	24	69 50	83 70			
30	60 70	67 55	16	34 50	39 10	7		18 60	20 50	26	76 10	91 10				
39	4	10 25	11 15	18	39 00	44 60		8	20 60	23 50	28	82 75	98 60			
	5	11 50	12 60	20	43 50	49 10		9	22 65	26 05	30	89 35	106 20			
	6	12 75	14 00	22	48 50	56 70		10	24 90	28 60	32	95 85	113 90			
	7	14 30	16 30	24	54 00	62 75		11	27 25	31 10	34	102 50	121 70			
	8	15 90	17 90	26	59 50	68 25		12	29 60	33 95	36	110 00	129 60			
	9	17 50	19 65	28	65 00	73 90		14	34 00	39 40	52	6	20 50	23 50		
	10	19 10	21 70	30	70 50	79 75	16	38 60	45 50	7		22 20	26 50			
	11	20 80	23 40	43	4	11 70	12 80	18	44 10	51 00		8	24 60	29 50		
	12	22 70	25 45		5	13 25	14 45	20	49 60	56 55		9	27 10	32 60		
	14	26 70	30 40		6	14 80	16 20	22	55 60	65 25		10	29 90	35 80		
16	30 70	34 40	7		16 75	18 85	24	61 60	71 30	11		32 70	39 40			
18	34 70	38 45	8		18 70	21 35	26	67 60	77 30	12		35 50	43 00			
20	39 40	43 30	9		20 65	23 40	28	73 60	83 30	14		41 50	50 00			
22	44 10	49 90	10		22 65	26 00	30	79 60	90 10	16		47 50	57 10			
24	48 90	54 70	11		24 70	28 35	47	4	13 15	14 30		18	53 50	64 30		
26	53 70	59 50	12		26 75	30 65		5	15 00	16 40	20	59 50	72 00			
28	58 50	64 35	14		31 00	35 50		6	17 00	18 50	22	65 75	79 60			
30	63 30	69 65	16	35 25	41 15	7		19 00	21 10	24	72 00	87 10				
40	4	10 50	11 90	18	39 75	46 00		8	21 10	24 10	26	78 50	94 80			
	5	11 85	13 40	20	44 50	50 85					28	85 00	102 60			

WROUGHT IRON RIM PULLEYS.—CONTINUED.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price	
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt
52	30	\$91 50	\$110 50	60	9	\$33 60	\$ 39 85	66	22	\$94 25	\$110 00	74	8	\$45 25	\$ 52 50
	32	98 00	118 50		10	36 80	43 55		24	103 25	120 40		9	48 75	56 80
	34	105 00	127 10		11	40 20	47 35		26	112 25	131 20		10	53 00	62 00
	36	113 00	135 30		12	43 60	52 25		28	121 75	142 40		11	57 35	67 30
54	6	22 00	25 00	62	14	50 60	60 10	68	30	131 50	153 00	76	12	62 10	72 70
	7	23 70	28 05		16	58 10	68 10		32	141 50	165 00		14	71 60	83 90
	8	26 20	31 20		18	65 70	76 50		34	151 75	177 50		16	82 25	95 40
	9	28 80	34 45		20	73 40	85 20		36	162 00	190 30		18	93 00	107 00
	10	31 60	37 70		22	81 20	94 20		6	34 15	38 35		20	103 75	118 80
	11	34 50	41 30		24	89 00	103 50		7	36 00	41 35		22	114 50	131 00
	12	37 40	44 90		26	97 00	112 90		8	38 50	44 95		24	125 75	143 40
	14	43 75	51 90		28	105 00	122 40		9	41 90	49 25		26	137 00	156 40
	16	50 50	59 00		30	113 00	132 00		10	45 60	53 65		28	148 25	170 00
	18	56 75	66 30		32	122 00	142 00		11	49 50	58 15		30	159 50	184 00
	20	63 00	73 80		34	131 00	152 50		12	53 50	62 75		32	171 00	198 50
	22	70 00	81 40		36	140 00	164 00		14	62 00	72 60		34	182 75	213 25
	24	76 40	89 40		6	28 40	31 90		16	71 00	83 10		36	195 00	227 75
	26	83 25	97 80		7	30 10	35 00		18	80 00	93 70	78	8	48 00	55 50
	28	90 50	106 40		8	32 60	38 40		20	89 00	104 50		9	51 50	59 80
	30	97 50	115 10		9	35 70	42 20		22	98 50	115 50		10	56 20	65 10
56	32	104 75	123 90		10	39 10	46 10		24	108 00	126 60		11	61 00	71 00
	34	112 00	132 90		11	42 65	50 00		26	117 50	138 00		12	66 00	76 50
	36	120 00	142 00		12	46 25	54 00		28	127 50	149 60		14	76 00	88 00
	6	23 50	26 50		14	53 50	63 00		30	137 50	161 40		16	87 00	100 00
	7	25 20	29 60		16	61 20	72 20		32	148 00	173 40		18	98 00	112 30
	8	27 70	32 80		18	69 35	81 60		34	159 00	185 80		20	109 00	124 90
	9	30 50	36 25		20	77 50	91 10		36	170 00	198 80		22	120 00	137 60
	10	33 30	39 50		22	85 60	100 70	70	6	36 05	40 55		24	132 00	151 10
	11	36 30	43 10		24	93 75	110 60		7	38 00	43 55		26	144 00	165 10
	12	39 30	46 80		26	102 00	120 30		8	40 50	47 25		28	156 00	179 60
	14	46 00	54 20		28	110 50	129 90		9	44 00	51 55		30	168 00	194 60
	16	53 50	61 80		30	119 25	140 10		10	47 70	56 05		32	180 00	209 10
	18	60 00	69 90		32	128 50	150 50		11	51 60	60 55		34	192 00	223 70
	20	66 50	78 10		34	137 75	161 00		12	55 85	65 20		36	204 00	238 70
	22	74 20	86 40		36	147 00	172 00		14	64 60	75 20	72	8	52 25	60 00
	24	80 80	94 80		6	30 30	34 05		16	74 25	86 30		9	56 35	64 75
	26	88 35	103 30	64	7	32 00	37 05		18	84 00	97 60		10	61 10	70 10
	28	96 00	112 00		8	34 50	40 55		20	93 75	109 00		11	65 90	75 55
	30	103 50	120 90		9	37 80	44 65		22	103 75	120 60		12	70 90	81 10
	32	111 00	130 00		10	41 50	48 85		24	113 75	132 40		14	80 50	92 80
	34	119 00	139 20		11	45 10	53 05		26	123 75	144 40		16	91 50	105 00
	36	127 00	148 40		12	48 90	57 35		28	134 00	156 60		18	103 00	118 00
58	6	25 00	28 25		14	56 30	66 45		30	144 25	169 00		20	114 50	131 40
	7	26 70	31 25		16	64 30	76 00		32	155 00	181 60		22	126 25	144 70
	8	29 20	34 50		18	73 00	85 60		34	166 00	194 40		24	138 50	158 80
	9	32 00	38 00		20	81 50	95 40		36	178 00	207 40		26	150 50	173 30
	10	35 00	41 60		22	90 00	105 40	74	6	38 00	42 75		28	163 00	188 00
	11	38 25	45 20		24	98 50	115 60		7	40 00	45 75		30	175 50	203 50
	12	41 50	49 10		26	107 00	126 00		8	42 50	49 55		32	188 00	218 20
	14	48 30	56 60		28	116 00	136 60		9	46 00	53 85		34	200 00	234 00
	16	55 80	64 50		30	125 50	147 40		10	49 70	58 65		36	213 00	250 00
	18	62 85	72 60		32	135 00	158 40		11	53 70	63 55	80	8	56 50	64 50
	20	70 00	81 10		34	144 50	169 60		12	58 20	68 55		9	61 20	69 70
	22	77 70	90 00		36	154 00	181 00		14	67 20	79 00		10	66 00	75 00
	24	85 00	99 10	66	6	32 20	36 20		16	77 50	90 30		11	70 80	80 40
	26	92 65	108 30		7	34 00	39 20		18	88 00	102 30		12	75 80	85 90
	28	100 50	117 60		8	36 50	42 80		20	98 50	114 70		14	85 00	97 40
	30	108 25	127 90		9	39 85	47 00		22	109 00	127 10		16	96 00	110 00
	32	116 50	136 50		10	43 50	51 30		24	119 50	139 60		18	108 00	124 00
	34	125 00	146 10		11	47 30	55 70		26	130 00	151 10		20	120 00	138 20
	36	133 50	155 80		12	51 20	60 20		28	140 50	163 90		22	132 50	152 60
60	6	26 50	30 00		14	59 15	69 60		30	151 00	176 90		24	145 00	167 20
	7	28 20	33 00		16	67 65	79 40		32	162 00	190 10		26	157 00	182 00
	8	30 70	36 25		18	76 50	89 40		34	173 00	203 50		28	170 00	197 00
					20	85 25	99 80		36	186 00	217 00				

CAST IRON WHOLE PULLEYS.**MACHINE MOULDED—BORED, TURNED AND BALANCED.****WHOLE PULLEY.****Plate 960.****SPLIT PULLEY.****Plate 961.**

For additional prices for Split and Tight-and-Loose Pulleys, see page 391.

Prices of Pulleys of larger dimensions than listed furnished on application.

PRICE LIST OF CAST IRON WHOLE PULLEYS.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price	
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt
3	3	\$ 1 35	\$ 1 45	10	3	\$ 2 15	\$ 2 30	14	3	\$ 2 70	2 90	17	5	\$ 4 25	\$ 4 75
4	4	1 50	1 60	4	4	2 55	2 75	4	4	3 10	3 30	6	6	4 85	5 45
5	5	1 70	1 80	5	5	2 95	3 15	5	5	3 50	3 75	7	7	5 50	6 15
6	6	1 95	2 05	6	6	3 30	3 60	6	6	4 00	4 25	8	8	6 15	6 75
4	3	1 45	1 55	7	7	3 65	4 00	7	7	4 50	4 85	9	9	6 80	7 45
4	4	1 65	1 75	8	8	4 00	4 40	8	8	5 05	5 50	10	10	7 45	8 15
5	5	1 85	2 00	9	9	4 45	4 85	9	9	5 60	6 10	11	11	8 10	8 90
6	6	2 10	2 25	10	10	4 90	5 30	10	10	6 15	6 70	12	12	8 80	9 65
5	3	1 55	1 65	11	3	2 25	2 40	11	6	6 70	7 35	14	10	10 50	11 50
4	4	1 80	1 95	4	4	2 65	2 80	12	7	7 25	7 90	16	12	12 10	13 40
5	5	2 15	2 30	5	5	3 05	3 25	14	8	8 35	9 00	3	3	3 45	3 80
6	6	2 50	2 65	6	6	3 45	3 75	15	3	2 90	3 10	4	4	4 00	4 35
6	3	1 65	1 75	7	7	3 85	4 25	4	4	3 30	3 55	5	5	4 55	5 00
4	4	1 95	2 10	8	8	4 30	4 80	5	5	3 75	4 05	6	6	5 15	5 70
5	5	2 30	2 45	9	9	4 75	5 30	6	6	4 25	4 65	7	7	5 85	6 45
6	6	2 65	2 80	10	10	5 25	5 80	7	7	4 80	5 25	8	8	6 55	7 20
7	7	3 00	3 15	12	3	2 40	2 55	8	8	5 35	5 85	9	9	7 20	7 95
8	8	3 35	3 55	4	4	2 80	2 95	9	9	5 90	6 45	10	10	7 85	8 70
7	3	1 75	1 90	5	5	3 20	3 35	10	6	6 45	7 10	11	11	8 50	9 45
4	4	2 15	2 30	6	6	3 60	3 85	11	7	7 05	7 75	12	12	9 30	10 25
5	5	2 50	2 70	7	7	4 00	4 35	12	7	7 65	8 40	14	11	11 15	12 25
6	6	2 85	3 10	8	8	4 45	4 90	14	9	9 10	10 00	16	12	12 85	14 30
7	7	3 20	3 50	9	9	4 90	5 40	16	3	3 05	3 35	3	3	3 65	4 05
8	8	3 55	3 90	10	10	5 40	5 90	4	4	3 55	3 85	4	4	4 20	4 60
8	3	1 85	2 00	11	11	5 90	6 40	5	5	4 05	4 40	5	5	4 80	5 30
4	4	2 25	2 40	12	12	6 40	6 90	6	6	4 60	5 00	6	6	5 50	6 00
5	5	2 65	2 80	13	3	2 55	2 70	7	7	5 15	5 70	7	7	6 20	6 75
6	6	3 00	3 20	4	4	2 95	3 10	8	8	5 80	6 40	8	8	6 90	7 50
7	7	3 35	3 60	5	5	3 35	3 50	9	9	6 40	7 10	9	9	7 55	8 25
8	8	3 70	4 00	6	6	3 75	4 00	10	10	7 00	7 80	10	10	8 25	9 00
9	3	2 00	2 20	7	7	4 15	4 50	11	11	7 60	8 50	11	11	9 00	9 90
4	4	2 40	2 60	8	8	4 60	5 00	12	12	8 20	9 20	12	12	9 80	10 80
5	5	2 80	3 00	9	9	5 05	5 50	14	14	9 80	10 90	14	11	11 80	12 95
6	6	3 15	3 40	10	10	5 60	6 15	16	11	11 40	12 50	16	13	13 80	15 10
7	7	3 50	3 80	11	11	6 15	6 70	17	3	3 25	3 55	18	15	15 80	17 25
8	8	3 85	4 00	12	12	6 70	7 30	4	4	3 75	4 05	20	3	3 85	4 25

MACHINE MOULDED PULLEYS.—CONTINUED.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price	
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt
20	4	\$ 4 40	\$ 4 80	25	8	\$ 9 20	\$10 15	30	8	\$11 45	\$12 85
	5	5 00	5 50		9	10 30	11 40		9	12 75	14 25
	6	5 70	6 20		10	11 40	12 45		10	14 05	15 70
	7	6 40	6 95		11	12 50	13 80		11	15 35	17 15
	8	7 10	7 70		12	13 65	15 05		12	16 75	18 90
	9	7 80	8 55		14	16 20	17 95		14	20 00	22 50
	10	8 65	9 50		16	18 80	20 90		16	23 30	26 20
	11	9 50	10 45		18	21 40	23 90		18	26 60	29 80
	12	10 35	11 50		20	24 30	27 15		20	29 90	33 40
	14	12 35	13 65	26	3	5 25	5 80	31	3	6 40	6 90
21	16	14 40	15 85		4	5 95	6 65		4	7 30	8 00
	18	16 50	18 15		5	6 85	7 60		5	8 30	9 15
	3	4 05	4 45		6	7 70	8 55		6	9 35	10 30
	4	4 60	5 00		7	8 60	9 60		7	10 45	11 65
	5	5 30	5 75		8	9 60	10 70		8	11 65	13 05
	6	6 00	6 55		9	10 80	11 95		9	12 95	14 45
	7	6 75	7 35		10	12 00	13 25		10	14 25	15 90
	8	7 55	8 30		11	13 20	14 55		11	15 55	17 35
	9	8 35	9 20		12	14 40	15 85		12	16 95	19 10
	10	9 20	10 15		14	17 00	18 80		14	20 20	22 70
22	11	10 05	11 15	27	16	19 70	21 90	32	16	23 55	26 45
	12	10 90	12 15		18	22 40	25 10		18	26 95	30 05
	14	13 10	14 55		20	25 40	28 40		20	30 35	33 70
	16	15 20	16 95		3	5 45	6 00		3	6 55	7 10
	18	17 30	19 35		4	6 25	6 90		4	7 45	8 20
	3	4 25	4 70		5	7 15	7 90		5	8 45	9 35
	4	4 80	5 25		6	8 05	8 95		6	9 55	10 50
	5	5 55	6 10		7	9 00	10 05		7	10 65	11 85
	6	6 30	7 00		8	10 05	11 25		8	11 85	13 25
	7	7 15	7 95		9	11 25	12 50		9	13 15	14 65
23	8	8 10	8 95	28	10	12 45	13 85	33	10	14 45	16 10
	9	9 00	9 90		11	13 70	15 15		11	15 75	17 55
	10	9 90	10 90		12	15 00	16 55		12	17 15	19 30
	11	10 75	11 90		14	17 80	19 75		14	20 40	22 90
	12	11 65	12 90		16	20 65	23 00		16	23 80	26 70
	14	13 90	15 35		18	23 50	26 35		18	27 30	30 30
	16	16 00	17 80		20	26 50	29 75		20	30 80	34 00
	18	18 20	20 30		3	5 70	6 25		3	6 75	7 30
	3	4 45	4 95		4	6 55	7 15		4	7 65	8 40
	4	5 05	5 60	29	5	7 50	8 25	34	5	8 65	9 55
24	5	5 85	6 45		6	8 45	9 35		6	9 75	10 75
	6	6 70	7 35		7	9 45	10 50		7	10 90	12 10
	7	7 55	8 40		8	10 55	11 80		8	12 15	13 55
	8	8 50	9 45		9	11 75	13 10		9	13 50	15 05
	9	9 40	10 50		10	12 95	14 45		10	14 80	16 55
	10	10 35	11 55		11	14 20	15 80		11	16 10	18 10
	11	11 30	12 60		12	15 60	17 25		12	17 65	19 80
	12	12 30	13 65		14	18 60	20 70		14	21 05	23 55
	14	14 60	16 25		16	21 60	24 15		16	24 50	27 40
	16	17 00	18 90		18	24 60	27 60		18	28 00	31 20
25	18	19 40	21 55	30	20	27 60	31 10	35	20	31 55	35 05
	3	4 80	5 30		3	5 95	6 45		3	6 95	7 50
	4	5 45	6 05		4	6 80	7 45		4	7 85	8 60
	5	6 30	6 90		5	7 80	8 60		5	8 85	9 75
	6	7 05	7 75		6	8 80	9 65		6	9 95	11 00
	7	7 90	8 65		7	9 85	10 90		7	11 20	12 40
	8	8 85	9 75		8	11 00	12 30		8	12 50	13 90
	9	9 80	10 85		9	12 25	13 65		9	13 85	15 45
	10	10 80	11 95		10	13 50	15 05		10	15 20	17 00
	11	11 80	13 05		11	14 75	16 45		11	16 50	18 60
25	12	12 90	14 30	31	12	16 15	18 05	32	12	18 20	20 30
	14	15 40	17 10		14	19 30	21 60		14	21 70	24 20
	16	17 90	19 90		16	22 45	25 20		16	25 20	28 10
	18	20 40	22 75		18	25 60	28 70		18	28 70	32 10
	20	23 20	25 90		20	28 75	32 25		20	32 30	36 10
	3	5 00	5 55		3	6 20	6 70		3	7 15	7 70
	4	5 70	6 35		4	7 10	7 80		4	8 05	8 85
25	5	6 55	7 25	32	5	8 10	8 95	33	5	9 10	10 05
	6	7 35	8 15		6	9 15	10 10		6	10 30	11 45
	7	8 25	9 05		7	10 25	11 45		7	11 65	12 95

MACHINE MOULDED PULLEYS.—CONTINUED.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price	
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt
35	8	\$13 00	\$14 50	44	8	\$17 10	\$19 00	54	14	\$41 40	\$48 00
	9	14 35	16 05		9	18 90	21 00		16	48 75	56 60
	10	15 80	17 65		10	20 75	23 00		18	56 15	65 20
	11	17 30	19 30		11	22 50	25 00		20	63 80	73 90
	12	18 65	21 15		12	24 60	27 20		22	71 50	82 80
	14	22 65	25 15		14	29 30	33 00		24	79 20	91 80
	16	26 20	29 15		16	34 50	38 80	56	6	23 10	26 00
	18	29 80	33 20		18	39 80	44 80		7	25 50	28 40
36	20	33 45	37 25	46	20	45 40	51 00		8	28 05	31 20
	3	7 35	7 90		3	9 40	10 30		9	29 60	34 10
	4	8 30	9 10		4	10 95	12 05		10	31 80	37 00
	5	9 40	10 40		5	12 60	13 85		11	34 35	39 90
	6	10 70	11 90		6	14 30	15 75		12	36 90	43 00
	7	12 10	13 50		7	16 10	17 80		14	44 60	51 90
	8	13 50	15 10		8	17 95	19 90		16	52 40	60 90
	9	14 90	16 70		9	19 75	22 00		18	60 30	69 90
38	10	16 40	18 30	48	10	21 60	24 10	58	20	68 20	79 00
	11	18 10	20 00		11	23 50	26 20		22	76 20	88 10
	12	20 10	22 00		12	25 60	28 40		24	84 30	97 30
	14	23 60	26 10		14	30 90	34 60		6	24 90	28 00
	16	27 20	30 20		16	36 50	40 80		7	27 40	30 60
	18	30 90	34 30		18	42 20	47 10		8	30 30	33 60
	20	34 60	38 40		20	48 10	53 70		9	32 00	36 70
	3	7 75	8 30	50	3	9 85	10 80	60	10	34 40	39 90
40	4	8 80	9 65		4	11 50	12 70		11	37 10	43 10
	5	10 10	11 15		5	13 30	14 70		12	39 90	46 30
	6	11 50	12 70		6	15 10	16 75		14	48 00	55 60
	7	13 00	14 30		7	16 90	18 85		16	56 20	65 00
	8	14 50	15 95		8	18 80	21 00		18	64 40	74 50
	9	16 00	17 60		9	20 70	23 20		20	72 60	84 00
	10	17 50	19 30		10	22 60	25 45		22	80 90	93 60
	11	19 20	21 10		11	24 60	27 75	62	24	89 20	103 20
42	12	21 20	23 20	52	12	26 70	30 15		6	26 70	30 00
	14	24 80	27 60		14	32 50	36 40		7	29 40	32 70
	16	28 70	32 30		16	38 60	43 20		8	32 60	35 90
	18	32 80	37 00		18	44 80	50 20		9	34 40	39 30
	20	37 00	41 50		20	52 00	58 10		10	37 20	42 70
	3	8 15	8 80		6	18 30	20 00		11	40 10	46 20
	4	9 25	10 20		7	19 60	21 70		12	43 00	49 70
	5	10 75	11 85	54	8	21 90	24 00	64	14	51 40	59 40
44	6	12 25	13 50		9	22 60	26 30		16	59 90	69 40
	7	13 75	15 20		10	24 30	28 60		18	68 50	79 40
	8	15 25	16 90		11	26 15	30 90		20	77 10	89 40
	9	16 75	18 60		12	28 05	33 20		22	85 70	99 40
	10	18 60	20 50		14	34 75	41 00		24	94 30	109 40
	11	20 30	22 40		16	41 40	48 80		6	33 00	36 00
	12	22 40	24 60		18	48 10	56 80		7	36 00	40 00
	14	26 40	29 20		20	55 00	64 80		8	39 50	44 00
46	16	30 90	34 20	56	22	62 00	72 80	66	9	43 00	48 50
	18	35 40	39 30		24	69 00	80 80		10	46 50	53 00
	20	40 00	44 50		6	19 60	22 00		11	50 00	57 50
	3	8 55	9 30		7	21 60	24 10		12	54 00	62 50
	4	9 80	10 80		8	23 80	26 50		14	62 50	72 50
	5	11 30	12 45		9	24 90	28 90		16	71 00	82 50
	6	12 85	14 20		10	26 75	31 30		18	79 50	92 50
	7	14 40	16 00		11	28 85	33 70		20	88 25	102 50
48	8	16 05	17 90	58	12	30 95	36 10		22	97 00	113 00
	9	17 70	19 85		14	38 00	44 20		24	106 00	124 00
	10	19 55	21 85		16	45 10	52 40		26	116 50	136 00
	11	21 25	23 85		18	52 20	60 60		28	127 00	149 00
	12	23 35	26 00		20	59 40	68 90		30	138 00	162 00
	14	27 50	31 20		22	66 75	77 30		6	34 25	38 00
	16	32 50	36 40		24	74 10	85 90		7	37 25	42 00
	18	37 50	41 80		6	21 30	24 00		8	40 75	46 00
50	20	42 50	47 30	60	7	23 50	26 20		9	44 25	50 00
	3	8 95	9 80		8	26 00	28 80		10	47 75	54 50
	4	10 35	11 40		9	27 30	31 50		11	51 25	59 00
	5	11 90	13 50		10	28 90	34 20		12	55 60	65 00
	6	13 50	15 00		11	31 65	36 90		14	64 30	75 00
	7	15 30	17 00		12	33 85	39 60		16	73 80	85 00

MACHINE MOULDED PULLEYS.—CONTINUED.

Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price		Diam., Inches	Face, Inches	Price	
		Single Belt	Double Belt			Single Belt	Double Belt			Single Belt	Double Belt
64	18	\$ 83 30	\$ 96 00	72	30	\$173 00	\$201 00	80	34	\$229 00	\$267 00
	20	92 80	108 00		32	186 00	216 00		36	244 00	284 00
	22	103 00	120 00		34	199 00	232 00		8	74 00	87 00
	24	113 20	132 00		36	212 00	248 00		9	79 00	92 00
	26	123 50	144 00		8	58 00	67 00		10	84 00	98 00
	28	134 00	157 00		9	62 00	72 00		11	89 00	104 00
66	30	145 50	170 00	74	10	67 00	77 00	82	12	94 00	110 00
	6	35 75	40 00		11	72 00	83 00		14	104 00	121 00
	7	38 75	44 00		12	77 00	89 00		16	115 00	134 00
	8	42 25	48 00		14	87 00	100 00		18	126 00	147 00
	9	45 75	52 00		16	97 00	112 00		20	138 00	161 00
	10	49 25	56 50		18	107 00	124 00		22	150 00	175 00
	11	52 75	61 00		20	117 00	136 00		24	163 00	191 00
	12	57 00	67 00		22	127 00	148 00		26	178 00	208 00
	14	66 50	77 50		24	138 00	160 00		28	193 00	225 00
	16	76 50	88 50		26	150 00	173 00		30	208 00	242 00
	18	86 50	100 50		28	162 00	188 00		32	223 00	260 00
	20	96 50	112 50		30	174 00	203 00		34	238 00	278 00
	22	107 00	124 50		32	186 00	218 00		36	253 00	296 00
	24	117 00	136 50		34	199 00	233 00	84	8	79 00	92 90
	26	127 50	149 00		36	212 00	248 00		9	83 00	97 00
	28	138 00	162 00	76	8	62 00	72 00		10	88 00	102 00
	30	152 00	178 00		9	66 00	77 00		11	93 00	108 00
68	6	37 25	41 50		10	71 00	83 00		12	98 00	114 00
	7	40 25	45 00		11	76 00	89 00		14	108 00	126 00
	8	43 75	49 00		12	81 00	95 00		16	120 00	140 00
	9	47 25	53 00		14	91 00	106 00		18	132 00	154 00
	10	50 75	57 50		16	101 00	117 00		20	145 00	169 00
	11	54 25	62 00		18	111 00	128 00		22	158 00	184 00
	12	58 50	68 00		20	121 00	140 00		24	171 00	199 00
	14	68 50	80 00		22	131 00	153 00		26	185 00	216 00
	16	79 00	92 00		24	143 00	168 00		28	201 00	234 00
	18	90 50	105 00		26	156 00	183 00		30	217 00	252 00
	20	102 00	118 00		28	169 00	198 00		32	233 00	271 00
	22	112 50	131 00		30	182 00	213 00		34	249 00	290 00
	24	123 00	144 00		32	196 00	228 00		36	265 00	309 00
	26	134 50	158 00		34	210 00	244 00	90	8	85 00	99 00
	28	147 00	172 00		36	224 00	260 00		9	91 00	106 00
	30	159 50	186 00	78	8	66 00	77 00		10	97 00	113 00
70	6	38 75	43 00		9	70 00	82 00		11	103 00	120 00
	7	41 75	47 00		10	75 00	88 00		12	109 00	127 00
	8	45 25	51 00		11	80 00	93 00		14	122 00	142 00
	9	48 75	55 00		12	85 00	99 00		16	135 00	157 00
	10	52 25	59 00		14	95 00	110 00		18	148 00	173 00
	11	55 75	64 00		16	105 00	123 00		20	162 00	189 00
	12	60 00	70 00		18	116 00	136 00		22	176 00	206 00
	14	71 00	82 00		20	127 00	149 00		24	190 00	223 00
	16	82 00	95 00		22	139 00	162 00		26	207 00	242 00
	18	93 50	108 00		24	151 00	177 00		28	224 00	262 00
	20	105 50	122 00		26	164 00	192 00		30	241 00	283 00
	22	117 50	136 00		28	178 00	207 00		32	259 00	304 00
	24	129 50	150 00		30	192 00	223 00		34	277 00	325 00
	26	141 50	164 00		32	206 00	239 00		36	295 00	346 00
	28	154 00	179 00	80	34	220 00	256 00	96	8	91 00	106 00
	30	166 50	194 00		36	234 00	273 00		9	98 00	114 00
72	6	40 25	45 00		8	70 00	82 00		10	105 00	122 00
	7	43 75	49 00		9	74 00	87 00		11	112 00	130 00
	8	48 25	54 00		10	79 00	93 00		12	120 00	140 00
	9	51 75	59 00		11	84 00	99 00		14	135 00	157 00
	10	55 75	64 00		12	90 00	105 00		16	150 00	175 00
	11	60 50	70 00		14	100 00	116 00		18	165 00	193 00
	12	66 00	76 00		16	110 00	129 00		20	180 00	211 00
	14	77 00	89 00		18	121 00	142 00		22	195 00	229 00
	16	88 00	102 00		20	133 00	155 00		24	211 00	247 00
	18	99 00	115 00		22	145 00	169 00		26	230 00	269 00
	20	110 00	129 00		24	157 00	183 00		28	250 00	292 00
	22	122 00	143 00		26	171 00	199 00		30	270 00	315 00
	24	134 00	157 00		28	185 00	216 00		32	290 00	338 00
	26	147 00	171 00		30	199 00	233 00		34	310 00	361 00
	28	160 00	186 00		32	214 00	250 00		36	330 00	384 00

SPLIT PULLEYS.

Additional list prices to be added to list prices of all Whole Pulleys.

Face, Diam.	3	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30	32	34	36
6 to 11	\$1 00	\$1 15	\$1 25	\$1 45	\$1 60	\$1 75	\$1 90	\$2 05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12 to 17	1 05	1 20	1 35	1 50	1 65	1 85	2 05	2 20	\$2 35	\$2 50	\$2 65	\$2 80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18 to 24	1 15	1 35	1 55	1 70	1 85	2 05	2 30	2 45	2 60	2 75	3 05	3 40	\$3 75	\$4 00	\$4 30	\$4 60	\$5 00	.....	.....	.....	.....	.....
25 to 27	1 25	1 45	1 65	1 85	2 05	2 25	2 50	2 80	3 10	3 40	3 75	4 25	4 75	5 25	5 80	6 45	7 05	.....	.....	.....	.....	.....
28 to 31	1 45	1 65	1 85	2 10	2 35	2 60	2 85	3 10	3 40	3 70	4 05	4 60	5 10	5 70	6 35	7 00	7 60	\$8 25	\$8 90	.....	.....	.....
32 to 36	1 70	1 90	2 10	2 35	2 60	2 85	3 15	3 45	3 70	4 00	4 50	5 10	5 75	6 40	7 05	7 70	8 40	9 10	9 90	.....	.....	.....
37 to 40	.....	2 40	2 60	2 90	3 15	3 40	3 70	4 00	4 30	4 60	5 15	5 70	6 50	7 20	7 90	8 60	9 30	10 00	10 70	.....	.....	.....
41 to 44	.....	2 90	3 10	3 40	3 60	3 80	4 10	4 40	4 70	5 00	5 60	6 35	7 05	7 90	8 70	9 60	10 30	11 10	12 10	.....	.....	.....
45 to 48	.....	3 30	3 50	3 70	3 90	4 20	4 60	4 90	5 30	5 70	6 50	7 30	8 10	9 00	9 90	10 80	11 70	12 70	13 80	.....	.....	.....
50 to 52	.....	.....	4 10	4 30	4 75	5 10	5 50	5 90	6 30	7 00	7 80	8 70	9 60	10 50	11 40	12 30	13 30	14 40	\$15 40	\$16 50	\$17 60	.....
54 to 56	.....	.....	4 50	4 80	5 20	5 60	6 00	6 40	6 80	7 60	8 40	9 30	10 30	11 30	12 30	13 30	14 30	15 30	16 40	17 50	18 70	.....
58 to 60	.....	.....	4 90	5 20	5 75	6 15	6 55	6 95	7 35	8 10	9 10	10 10	11 10	12 10	13 10	14 20	15 40	16 60	17 80	19 00	20 20	.....
62 to 64	.....	.....	.....	5 30	5 60	6 10	6 50	7 00	7 45	7 90	8 70	9 70	10 70	11 70	12 70	13 70	14 90	16 20	17 30	18 70	20 00	21 30
66 to 68	.....	.....	.....	5 70	6 00	6 45	6 85	7 30	7 75	8 20	9 10	10 10	11 10	12 20	13 30	14 40	15 70	16 90	18 10	19 50	20 90	22 40
70 to 72	.....	.....	.....	6 10	6 40	6 90	7 35	7 80	8 25	8 70	9 80	10 90	12 00	13 20	14 40	15 60	17 20	18 70	20 10	21 60	23 10	24 50
74 to 76	.....	.....	.....	6 50	6 80	7 35	7 80	8 25	8 70	9 20	10 30	11 50	12 70	13 95	15 20	16 70	18 30	19 90	21 60	23 30	24 90	26 50
78 to 80	.....	.....	.....	.....	.....	7 80	8 25	8 70	9 15	9 70	10 80	12 10	13 30	14 60	15 90	17 50	19 20	20 80	22 40	24 10	25 90	27 50
82 to 84	.....	.....	.....	.....	.....	8 30	8 80	9 30	9 80	10 40	11 50	13 00	14 40	15 80	17 30	19 10	20 90	22 60	24 30	26 20	28 00	29 70
86 to 88	.....	.....	.....	.....	.....	9 00	9 50	10 00	10 60	11 20	12 30	13 70	15 30	17 00	18 60	20 20	22 00	23 70	25 50	27 30	29 30	31 30
90 to 92	.....	.....	.....	.....	.....	9 80	10 30	10 80	11 50	12 30	13 20	14 60	16 10	17 80	19 50	21 10	22 90	24 60	26 50	28 30	30 40	32 90
94 to 96	.....	.....	.....	.....	.....	10 70	11 20	11 70	12 40	13 10	14 00	15 50	17 00	18 70	20 40	22 00	23 80	25 60	27 50	29 40	31 50	34 50

PLAIN TIGHT-AND-LOOSE PULLEYS.

Additional list prices per pair to be added to list prices of Whole Pulleys.

Face	3	4	5	6	7	8	9	10	11	12
Bore, 1 $\frac{3}{8}$	\$0 80	1 10	1 40	1 70	2 00	2 30	2 60	2 90	3 20	3 50
Bore, 1 $\frac{1}{2}$	95	1 25	1 60	1 95	2 30	2 65	2 90	3 25	3 60	3 95
Bore, 1 $\frac{7}{8}$	1 15	1 45	1 80	2 15	2 50	2 85	3 20	3 55	3 90	4 30
Bore, 1 $\frac{1}{2}$	1 30	1 65	2 00	2 35	2 70	3 05	3 40	3 75	4 20	4 70
Bore, 2 $\frac{1}{8}$	1 45	1 80	2 20	2 65	3 10	3 55	4 00	4 45	4 90	5 35
Bore, 2 $\frac{1}{4}$	1 60	2 05	2 50	2 95	3 40	3 85	4 30	4 75	5 20	5 65
Bore, 2 $\frac{3}{8}$	1 80	2 25	2 70	3 15	3 60	4 05	4 50	4 95	5 40	5 90
Bore, 2 $\frac{1}{2}$	2 05	2 50	2 95	3 45	3 95	4 45	4 95	5 45	5 95	6 45

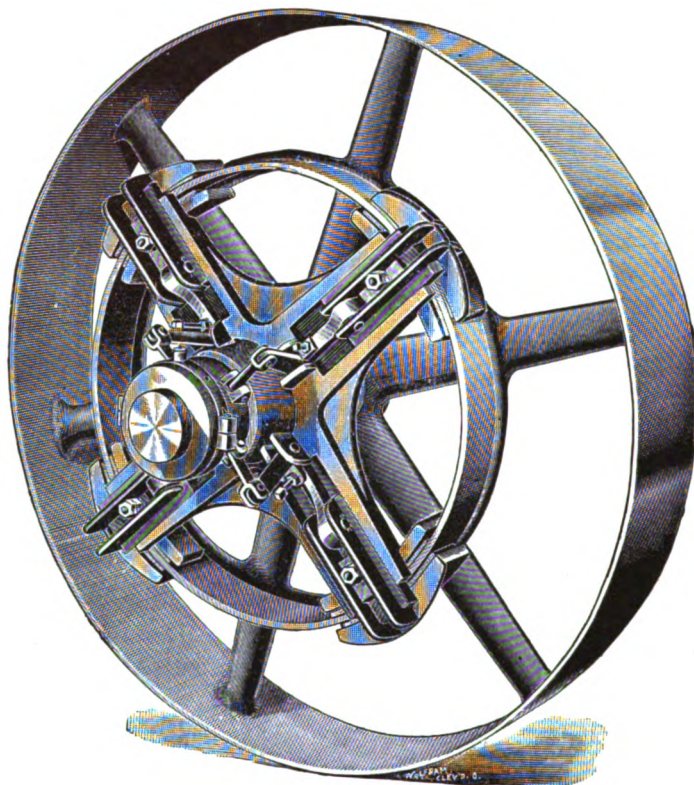
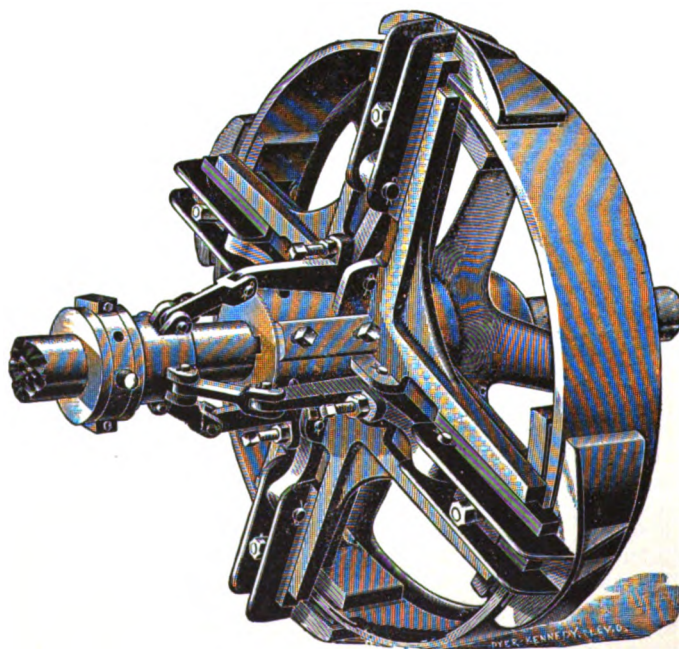
KEY-SEATING PULLEYS.

Width of Key Seat	Diameter of Shaft	Width of Face, Inches							
		3 to 5	6 to 8	9 to 12	13 to 16	17 to 20	21 to 24	25 to 30	31 to 36
$\frac{1}{4}$ inch	1 to 1 $\frac{3}{8}$ inch	\$0 36	36	.....	.....	.....	.....	.....	.....
$\frac{3}{8}$ inch	1 $\frac{1}{8}$ to 1 $\frac{1}{2}$ inch	36	36	\$0 45	.....	.....	.....	.....	.....
$\frac{1}{2}$ inch	1 $\frac{3}{8}$ to 2 $\frac{1}{4}$ inch	36	45	54	\$0 65	1 00	.....	.....	.....
$\frac{5}{8}$ inch	2 $\frac{1}{8}$ to 2 $\frac{3}{4}$ inch	45	54	62	78	1 20	.....	.....	.....
$\frac{3}{4}$ inch	2 $\frac{1}{2}$ to 3 $\frac{1}{4}$ inch	54	62	66	85	1 30	\$1 70	2 10	3 30
$\frac{7}{8}$ inch	3 $\frac{1}{8}$ to 3 $\frac{1}{2}$ inch	60	66	78	1 00	1 70	2 10	2 50	3 60
1 inch	3 $\frac{1}{2}$ to 4 $\frac{1}{4}$ inch	66	78	85	1 30	2 10	2 50	3 00	4 20
1 $\frac{1}{8}$ inch	4 $\frac{1}{8}$ to 4 $\frac{1}{2}$ inch	85	1 00	1 30	1 70	2 50	3 00	3 30	4 55
1 $\frac{1}{4}$ inch	4 $\frac{3}{4}$ to 5 $\frac{1}{4}$ inch	1 10	1 30	1 70	2 15	3 00	3 30	3 80	5 10

All Double-Arm Pulleys are provided with Feather Keys. We are prepared to furnish any size Key Seat not mentioned in above list.

HILL'S SPECIAL CLUTCHES AND COUPLINGS.

Special Catalogue on Application.

STANDARD CLUTCH AND PULLEY.**Plate 962.****STANDARD CLUTCH COUPLING.****Plate 963.**

Send for Descriptive Catalogue and Price List.

UNION DRAWN STEEL COMPANY'S COLD DIE-ROLLED STEEL AND IRON SHAFTING.

Accurate to size, absolutely Straight, Polished Surface and Machine Cut Ends.
United States Standard Gauge.

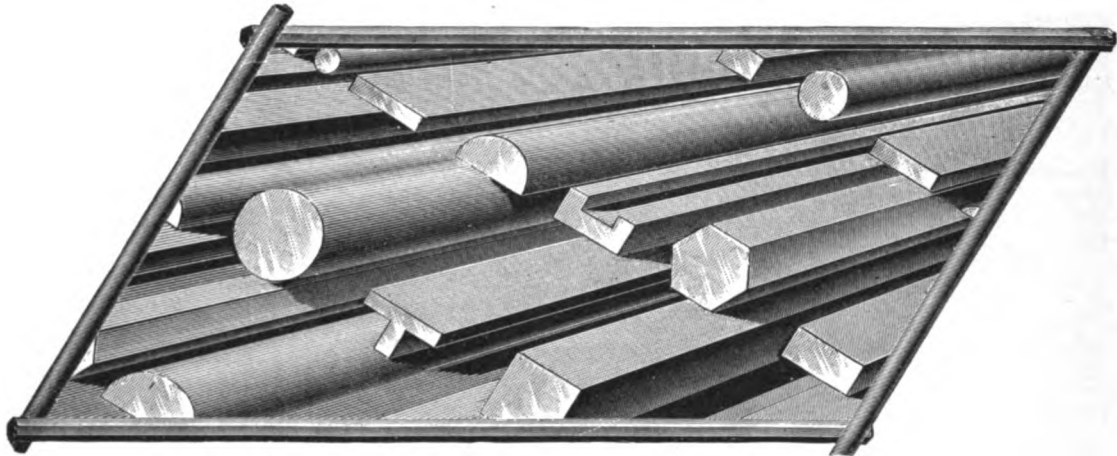


Plate 964.

THE STEVEN'S INSTITUTE OF TECHNOLOGY (HOBOKEN, N. J.,) HAS JUST COMPLETED A SERIES OF TESTS
WHICH ESTABLISH THE FOLLOWING FACTS:

Shafting turned from bars, such as used for our Cold-Die Rolled Steel, show a tensile strength of 62,000 pounds, and an elastic limit of 44,000 pounds per square inch; while the same bars after being treated by our process, show a tensile strength of 86,900 pounds, and an elastic limit of 71,000 pounds per square inch. The resistance to transverse stress is increased about 100 per cent, and the torsional strength from 50 to 60 per cent.

We use only the best quality of Soft Steel and are manufacturing under recent patents, covering machinery and appliances, by a process superior to anything known for producing work mathematically accurate as to size, absolute straightness, and of a perfectly polished surface. For Piston and Pump Rods we use a special grade of steel, and can produce them strictly uniform in size and quality.

PRICE LIST COLD DIE-ROLLED STEEL AND IRON SHAFTING.—ROUNDS.

Diam-eter	Weight Per Ft.	Price Per Lb.	Diam-eter	Weight Per Ft.	Price Per Lb.	Diam-eter	Weight Per Ft.	Price Per Lb.
$\frac{1}{4}$	.167	\$0 13	$1\frac{3}{8}$	7.04	\$0 05	3	24.06	\$0 05
$\frac{5}{16}$	.259	11	$1\frac{1}{2}$	7.60	5	$3\frac{1}{8}$	24.58	5 $\frac{1}{2}$
$\frac{3}{8}$	.370	9	$1\frac{3}{4}$	8.16	5	$3\frac{3}{8}$	26.09	5 $\frac{1}{2}$
$\frac{7}{16}$	.510	9	$1\frac{7}{8}$	8.78	5	$3\frac{1}{2}$	27.16	5 $\frac{1}{2}$
$\frac{1}{2}$	.666	9	$1\frac{1}{4}$	9.39	5	$3\frac{3}{4}$	28.24	5 $\frac{1}{2}$
$\frac{5}{8}$	.843	7 $\frac{3}{4}$	$1\frac{3}{8}$	10.00	5	$3\frac{5}{8}$	29.40	5 $\frac{1}{2}$
$\frac{3}{4}$	1.05	7 $\frac{3}{4}$	2	10.65	5	$3\frac{7}{8}$	30.43	5 $\frac{1}{2}$
$\frac{7}{8}$	1.25	7 $\frac{3}{4}$	$2\frac{1}{8}$	11.15	5	$3\frac{7}{8}$	31.50	5 $\frac{1}{2}$
$\frac{1}{4}$	1.50	6 $\frac{1}{2}$	$2\frac{1}{4}$	12.07	5	$3\frac{1}{2}$	32.64	5 $\frac{1}{2}$
$\frac{1}{2}$	1.757	6 $\frac{1}{2}$	$2\frac{3}{8}$	12.79	5	$3\frac{9}{8}$	33.84	6
$\frac{3}{4}$	2.03	6 $\frac{1}{2}$	$2\frac{1}{2}$	13.49	5	$3\frac{3}{4}$	35.20	6
$\frac{1}{2}$	2.34	6 $\frac{1}{2}$	$2\frac{5}{8}$	14.00	5	$3\frac{1}{4}$	36.40	6
1	2.64	5 $\frac{1}{2}$	$2\frac{3}{4}$	15.07	5	$3\frac{1}{2}$	37.45	6
$1\frac{1}{8}$	3.00	5 $\frac{1}{2}$	$2\frac{7}{8}$	15.83	5	$3\frac{7}{8}$	39.85	6
$1\frac{1}{4}$	3.33	5 $\frac{1}{2}$	$2\frac{1}{2}$	16.68	5	$3\frac{1}{2}$	41.04	6
$1\frac{1}{8}$	3.74	5 $\frac{1}{2}$	$2\frac{9}{8}$	17.55	5	4	42.50	6
$1\frac{1}{4}$	4.16	5 $\frac{1}{2}$	$2\frac{5}{4}$	18.32	5	$4\frac{1}{4}$	48.26	6
$1\frac{3}{8}$	4.61	5 $\frac{1}{2}$	$2\frac{1}{2}$	19.31	5	$4\frac{1}{8}$	52.62	6
$1\frac{1}{2}$	5.048	5 $\frac{1}{2}$	$2\frac{3}{4}$	20.18	5	$4\frac{1}{2}$	54.11	6
$1\frac{3}{4}$	5.50	5	$2\frac{7}{8}$	21.15	5	$4\frac{3}{4}$	60.88	6 $\frac{1}{2}$
$1\frac{1}{2}$	6.00	5	$2\frac{7}{8}$	22.09	5	$4\frac{1}{2}$	65.50	6 $\frac{1}{2}$
$1\frac{3}{4}$	6.52	5	$2\frac{1}{2}$	22.96	5	5	67.50	6 $\frac{1}{2}$

Prices quoted are for Shafts 1 foot to 24 feet, inclusive. Extra for Pump and Piston Rods, $\frac{1}{2}$ cent net per pound. Boxing charged at cost. Special and irregular shapes to order. Prices Turned Shafts, 5 $\frac{1}{2}$ to 6 inches, upon application. All Shafts larger than 4 inches are turned and polished.

EXTRAS FOR CUTTING SHORT AND LONG LENGTHS.

For Shafts 6 inches to 11 $\frac{3}{4}$ inches long, $\frac{1}{2}$ cent per pound, net, extra. For Shafts 3 inches to 5 $\frac{3}{4}$ inches long, 1 cent per pound, net, extra. For Shafts shorter than 3 inches a special price will be quoted upon application. For Shafts over 24 feet and less than 30 feet, $\frac{1}{2}$ cent per pound extra. For Shafts 30 feet and less than 35 feet, 1 cent per pound extra. For Shafts 35 feet and less than 40 feet, 1 $\frac{1}{2}$ cent per pound extra. For Shafts 40 feet and less than 45 feet, 2 cents per pound extra. For Shafts 45 feet and over, 2 $\frac{1}{2}$ cents per pound extra.

SHAFTING.**STEEL OR IRON, TURNED, COLD-ROLLED AND POLISHED.**

Diameter	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{4}$
Per foot	\$0 35	47	63	80	98	1 20	1 43	1 67
Boxing, per foot, net.	3	3 $\frac{1}{2}$	4	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$
Feet	10	11	12	13	14	15	16	17
Diameter	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$	3 $\frac{1}{4}$	4 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$	4 $\frac{1}{4}$
Per foot	\$2 14	2 50	2 85	3 25	3 80	4 25	5 10	5 55
Boxing, per foot, net.	6	6 $\frac{1}{2}$	7 $\frac{1}{2}$	9	.....	.....	.....	.....
Feet	18	19	20	21	22	23	24	25

PLAIN SET COLLARS.

Diameter Shaft	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{4}$	3 $\frac{3}{8}$
Price	\$0 50	55	65	75	95	1 10	1 30	1 50	1 75
Diameter Shaft	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$	4 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{4}$	6 $\frac{3}{8}$
Price	\$2 05	2 30	2 60	3 20	3 70	4 20	4 90	5 50	6 30

Intermediate sizes, proportionate prices

FLANGE COUPLING.

Plate 966.

Diameter of Shaft	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{4}$	3 $\frac{3}{8}$
Not Fitted	\$6 50	7 25	8 50	9 50	10 75	12 75	14 75	16 75	18 75
Fitted to Shaft	9 00	10 10	11 70	13 50	14 75	17 50	19 50	22 75	24 75
For Turned Bolts and Reamed Holes, add,	60	85	85	1 00	1 00	1 50	1 90	1 90	2 20
If Turned all over, Turned Bolts, etc., add,	4 00	4 40	4 80	5 50	5 80	6 75	7 15	7 90	8 40
Diameter of Shaft	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$	4 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{4}$	6 $\frac{3}{8}$
Not Fitted	\$22 25	27 25	31 00	34 00	39 50	46 50	57 50	69 00	87 00
Fitted to Shaft	29 00	34 00	39 00	42 00	49 50	56 50	71 50	84 00	105 00
For Turned Bolts, Reamed Holes, add,	2 20	2 20	2 60	2 60	3 20	3 20	3 20	3 30	3 30
If Turned all over, Turned Bolts, etc., add,	9 10	9 45	10 50	11 40	12 80	13 70	14 60	15 30	16 20

Intermediate sizes, proportionate prices. For reducing Flange Couplings take one-half of Combined list prices of the two sizes required.

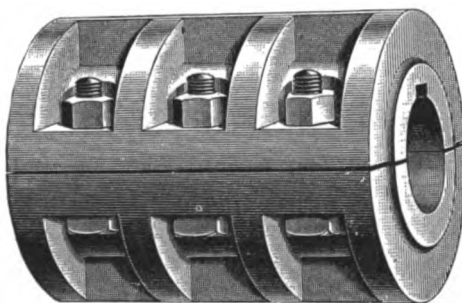
IMPROVED COMPRESSION COUPLINGS.

Plate 967.

For reducing Compression Couplings use the List of Coupling of size of largest end.

Diameter of Shaft	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{4}$
Not Fitted	\$ 3 60	4 20	4 90	5 60	7 50	8 75	10 50	12 25
Fitted.	5 20	5 80	6 50	7 20	9 90	12 00	14 00	16 25
Diameter of Shaft	3 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$	4 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{4}$
Not Fitted	\$14 00	15 50	17 75	23 25	26 00	31 00	35 50	42 00
Fitted	18 75	20 00	23 40	29 25	32 00	39 00	43 50	52 00

Intermediate sizes at proportionate prices. All sizes from 2 $\frac{3}{8}$ inches up are provided with a Key and Steel Pins without extra charge; the smaller sizes do not require Keys.

COMMON FLAT BOXES. BABBITTED BEARINGS.

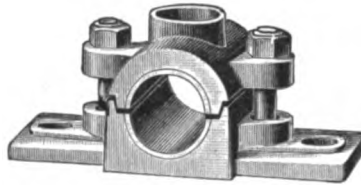


Plate 968.

Diameter of Shaft	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$
Length of Bearing	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4	4	4 $\frac{1}{2}$	4 $\frac{1}{2}$
Price	\$1 25	1 50	1 80	2 10	2 50	2 90
Diameter of Shaft	2 $\frac{1}{8}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
Length of Bearing	5	5	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6	6
Price	\$3 45	4 00	4 50	5 00	6 00	7 00

SOLID JOURNAL BOXES. BORED BEARINGS.

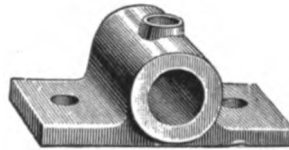


Plate 969.

Diameter of Shaft	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
Length of Bearing	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$
Price	\$1 15	1 35	1 50	1 80	2 10	2 40	2 70	3 10

RIGID PILLOW BLOCKS. HORIZONTAL AND VERTICAL—SELF-OILING BABBITTED BEARINGS.

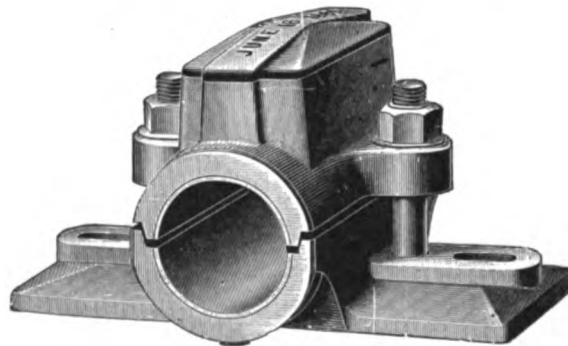


Plate 970.

Diameter of Shaft	1 $\frac{3}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$
Length of Bearing	4 $\frac{1}{2}$	5	6	7	7 $\frac{1}{2}$	8	8 $\frac{1}{2}$	9	9 $\frac{1}{2}$
Price without Base Plate . .	\$1 70	2 00	2 40	3 00	3 60	4 20	4 90	5 70	6 75
Price with Base Plate . . .	5 70	6 40	7 20	8 25	9 40	10 40	11 50	12 80	14 50
Diameter of Shaft	3 $\frac{1}{8}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{2}$
Length of Bearing	10	11	12	13	13	14	15	16 $\frac{1}{2}$	18
Price without Base Plate . .	\$7 80	9 10	10 70	12 20	14 10	17 20	20 50	24 00	29 00
Price with Base Plate . . .	16 00	18 00	20 70	23 20	26 50	31 00	35 25	40 00	46 50

We furnish Bearings for intermediate sized Shafts at price of nearest size listed.

SINGLE BRACE DROP HANGERS AND FLOOR STANDS. BABBITTED BEARINGS.

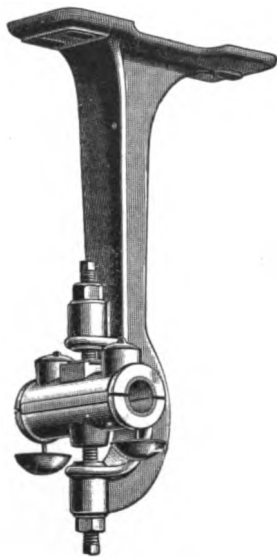


Plate 971.

Diam. of Shaft	Drop	Price	Diam. of Shaft	Drop	Price	Diam. of Shaft	Drop	Price	Diam. of Shaft	Drop	Price
1 $\frac{3}{8}$	8	2 70	1 $\frac{1}{2}$	24	8 40	2 $\frac{1}{8}$	16	11 00	3 $\frac{1}{8}$	12	15 40
	10	2 85		27	8 80		18	11 50		14	15 90
	12	3 00		30	9 30		20	12 00		16	16 40
	14	3 20		36	10 70		22	12 50		18	16 90
	16	3 40	2 $\frac{3}{8}$	8	6 30		24	13 00		20	17 40
	18	3 60		10	6 75		27	13 60		22	18 10
1 $\frac{7}{8}$	8	3 00		12	7 15	2 $\frac{1}{2}$	10	11 00	3 $\frac{1}{2}$	12	18 00
	10	3 35		14	7 60		12	11 50		14	18 50
	12	3 70		16	8 00		14	12 00		16	19 00
	14	4 00		18	8 40		16	12 50		18	19 60
	16	4 35		20	8 80		18	13 00		20	20 30
	18	4 70		22	9 20		20	13 50		22	21 00
	20	5 20		24	9 60		22	14 10		24	21 70
1 $\frac{1}{2}$	8	4 35		27	10 20		24	14 80		26	22 40
	10	4 70		30	10 90		27	15 40		28	23 25
	12	5 00		36	12 20		30	16 30		30	23 50
	14	5 35	2 $\frac{7}{8}$	10	8 00	3 $\frac{3}{8}$	10	12 90	3 $\frac{1}{2}$	12	20 30
	16	5 70		12	8 40		12	13 40		14	20 90
	18	6 05		14	8 90		14	13 90		16	21 70
	20	6 45		16	9 35		16	14 40		18	22 50
	22	6 90		18	9 75		18	14 90		20	23 80
	24	7 35		20	10 20		20	15 50		22	24 00
1 $\frac{5}{8}$	8	5 30		22	10 60		22	16 10		24	24 70
	10	5 65		24	11 00		24	16 70		26	25 40
	12	6 00		27	11 50		27	17 50		28	26 10
	14	6 35		30	12 70		30	18 30		30	28 00
	16	6 75		36	14 00		36	20 00			
	18	7 15	2 $\frac{1}{4}$	10	9 50						
	20	7 60		12	10 00						
	22	8 00		14	10 50						

DOUBLE BRACE SCREW DROP HANGERS. BABBITTED BEARINGS.

Diam. of Shaft	Drop	Price	Diam. of Shaft	Drop	Price	Diam. of Shaft	Drop	Price	Diam. of Shaft	Drop	Price
1 $\frac{7}{8}$	10	5 75	2 $\frac{1}{8}$	14	11 85	3 $\frac{1}{8}$	22	20 30	4 $\frac{1}{8}$	14	28 00
	12	6 00		16	12 40		24	20 90		16	28 80
	14	6 30		18	13 00		27	21 60		18	29 60
	16	6 65		20	13 60		30	22 80		20	30 40
	18	7 00		22	14 20		36	24 50		22	31 30
	20	7 35		24	14 80	3 $\frac{7}{8}$	10	19 40		24	32 20
1 $\frac{1}{2}$	10	6 60		27	15 50		12	20 10		27	33 10
	12	6 90		30	16 20		14	20 80		30	34 00
	14	7 20		36	17 00		16	21 50		36	35 00
	16	7 50	2 $\frac{1}{2}$	10	11 90		18	22 20	4 $\frac{7}{8}$	14	31 00
	18	7 80		12	12 50		20	22 90		16	31 90
	20	8 10		14	13 10		22	23 60		18	32 80
	22	8 60		16	13 80		24	24 35		20	33 70
	24	9 10		18	14 50		27	25 25		22	34 60
1 $\frac{5}{8}$	10	7 00		20	15 10		30	26 20		24	35 50
	12	7 35		22	15 70		36	27 00		27	36 40
	14	7 75		24	16 40	3 $\frac{1}{2}$	12	22 40		30	37 30
	16	8 35		27	17 40		14	23 00		36	38 50
	18	8 90		30	18 50		16	23 70	4 $\frac{1}{2}$	14	35 30
	20	9 50		36	20 50		18	24 40		16	36 20
	22	10 10	2 $\frac{3}{4}$	10	13 10		20	25 10		18	37 10
	24	10 70		12	13 70		22	25 80		20	38 00
	27	11 40		14	14 30		24	26 60		22	39 00
	30	12 00		16	15 00		27	27 50		24	40 00
2 $\frac{1}{8}$	10	8 90		18	15 70		30	28 50		27	41 00
	12	9 35		20	16 30		36	29 50		30	42 00
	14	9 80		22	16 90	3 $\frac{3}{4}$	12	24 40		36	44 50
	16	10 35		24	17 50		14	25 10	4 $\frac{3}{8}$	14	40 00
	18	10 90		27	19 10		16	25 90		16	41 00
	20	11 50		30	20 30		18	26 60		18	42 00
	22	12 10		36	22 40		20	27 40		20	43 00
	24	12 70	3 $\frac{1}{4}$	10	16 70					22	44 00
	27	13 40		12	17 30					24	45 00
	30	14 10		14	17 90					27	46 50
2 $\frac{7}{8}$	10	10 80		16	18 50					30	48 00
	12	11 30		18	19 10					36	51 00
				20	19 70						

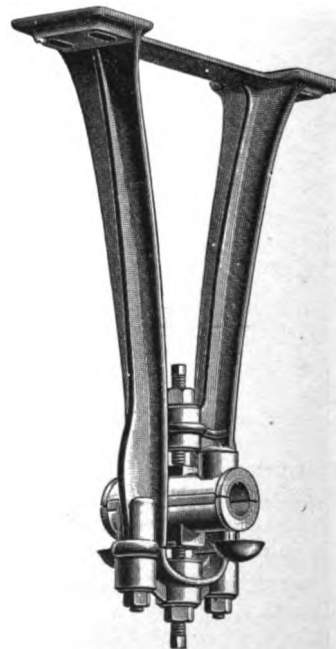
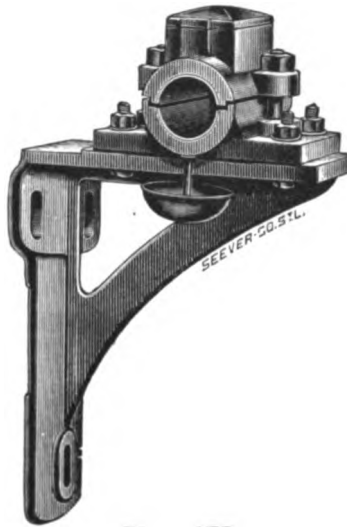
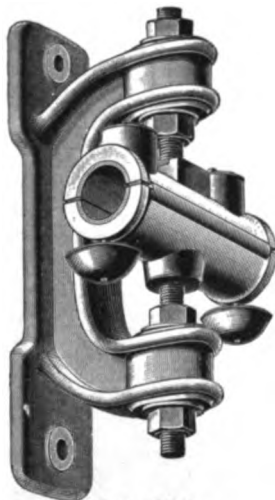


Plate 972.

RIGID POST HANGERS.**Plate 973.**

Diameter of Shaft	1 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$
Length of Bearing	4 $\frac{1}{2}$	5	6	7	7 $\frac{1}{2}$	8	8 $\frac{1}{2}$	9	9 $\frac{1}{2}$
From Center Shaft to Back of Hanger . . .	5 $\frac{3}{8}$	5 $\frac{7}{8}$	6	6 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{3}{8}$	7	7 $\frac{1}{2}$	8
Price	\$ 3 10	3 50	4 20	4 90	5 70	6 60	7 90	9 30	10 70
Diameter of Shaft	3 $\frac{1}{8}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{1}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{8}$	5 $\frac{1}{2}$
Length of Bearing	10	11	12	13	13	14	15	16 $\frac{1}{2}$	18
From Center Shaft to Back of Hanger . . .	8	8 $\frac{1}{2}$	8 $\frac{3}{4}$	8 $\frac{5}{8}$	9 $\frac{1}{2}$	9 $\frac{3}{4}$	9 $\frac{5}{8}$	9 $\frac{1}{2}$	9 $\frac{3}{4}$
Price	\$12 40	14 70	17 00	19 50	23 50	30 00	35 00	40 00	47 00

Can furnish Hangers for intermediate sizes of Shaft, at prices of nearest size listed.

**Plate 974.****ADJUSTABLE POST HANGERS.****BABBITTED BEARINGS.**

Diameter of Shaft	1 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$
Length of Bearing	6	6	7	8	9
From Center of Shaft to Back of Hanger	6	6	6	6	6
Diameter of Shaft	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$	3 $\frac{7}{8}$
Length of Bearing	10	11	12	12	12 $\frac{1}{2}$
From Center of Shaft to Back of Hanger	6	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
Diameter of Shaft	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{1}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$
Length of Bearing	13	14	14 $\frac{1}{2}$	15	15 $\frac{1}{2}$
From Center of Shaft to Back of Hanger	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$
Diameter of Shaft	4 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{2}$	5 $\frac{7}{8}$	5 $\frac{1}{2}$
Length of Bearing	16	17	18	18	18
From Center of Shaft to Back of Hanger	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$

Diameter of Shaft	1 $\frac{1}{8}$	1 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$
Price	\$ 4 30	5 00	5 95	6 90	7 80	9 40	10 90	12 60	14 20
Diameter of Shaft	3 $\frac{1}{8}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{1}{8}$	4 $\frac{7}{8}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{8}$	5 $\frac{1}{2}$
Price	\$16 70	19 50	22 00	24 00	26 00	31 50	35 00	41 00	50 00

Can furnish Hangers for all intermediate sizes of Shaft, at prices of nearest size listed.

HILL'S ADJUSTABLE COLLAR OILING BEARING.

WITH PEDESTAL COMPLETE.

BALL AND SOCKET COLLAR OILING BEARING AND PEDESTAL.

WITH LATERAL SREW ADJUSTMENT.

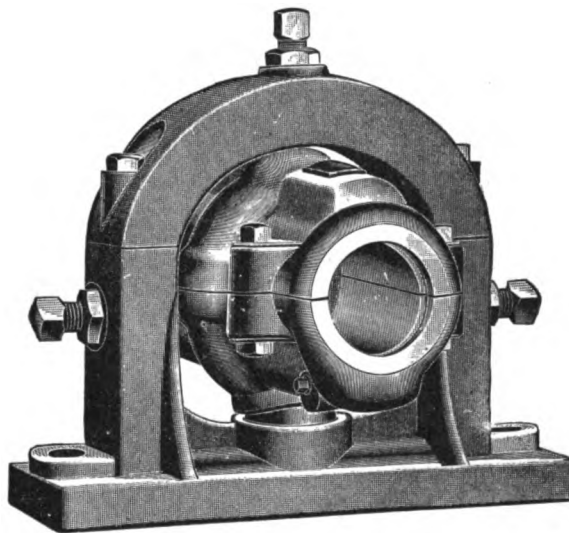


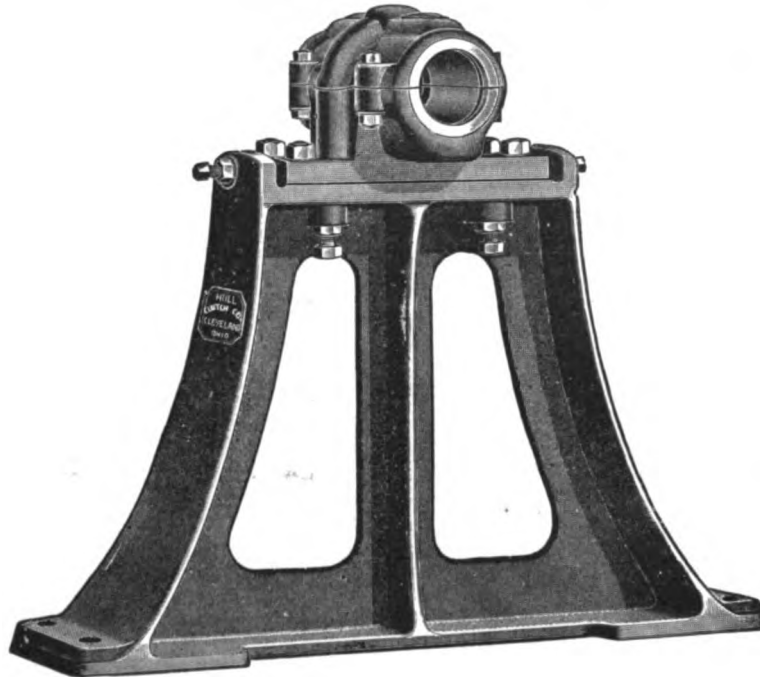
Plate 975.

Diameter Shaft	No. Pedestal	Standard Length Bearing	Special Length Bearing	Height to Center Shaft	Price
1 $\frac{1}{8}$ inch	2	8 inch	.....	5 $\frac{1}{4}$ inch	\$ 13 00
2 $\frac{1}{8}$ inch	2	10 inch	7 $\frac{1}{2}$ inch	5 $\frac{1}{4}$ inch	18 00
2 $\frac{1}{2}$ inch	3	12 inch	9 inch	6 inch	25 00
3 $\frac{1}{8}$ inch	3	14 inch	10 $\frac{1}{2}$ inch	6 inch	30 00
3 $\frac{1}{2}$ inch	4	16 inch	12 inch	7 $\frac{1}{2}$ inch	40 00
4 $\frac{1}{8}$ inch	4	18 inch	13 $\frac{1}{2}$ inch	7 $\frac{1}{2}$ inch	45 00
5 inch	5	20 inch	15 inch	9 inch	60 00
5 $\frac{1}{2}$ inch	5	21 inch	16 $\frac{1}{2}$ inch	9 inch	65 00
6 inch	6	22 inch	18 inch	10 $\frac{1}{2}$ inch	85 00
6 $\frac{1}{2}$ inch	6	24 inch	19 $\frac{1}{2}$ inch	10 $\frac{1}{2}$ inch	95 00
7 inch	7	26 inch	21 inch	..... . . . .	120 00
7 $\frac{1}{2}$ inch	7	27 inch	22 $\frac{1}{2}$ inch	..... . . . .	130 00
8 inch	8	29 inch	24 inch	..... . . . .	160 00
9 inch	9	32 inch	27 inch	..... . . . .	200 00

RIGID COLLAR OILING BEARING AND FLOOR STAND.

38½ inches high to center of Shaft.

HAVING LATERAL AND VERTICAL SCREW ADJUSTMENT.

**Plate 976.**

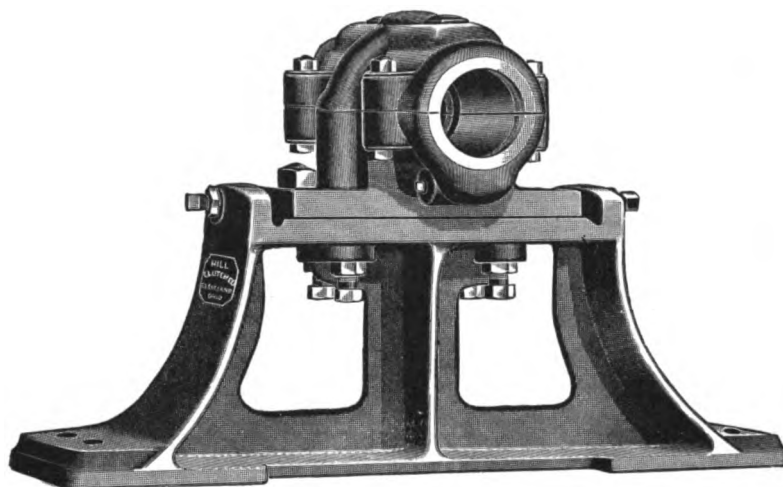
Diameter Shaft	No. Stand	Standard Length Bearing	Special Length Bearing	Price
2½ inch	3	12 inch	9 inch	\$ 60 00
3⅞ inch	3	14 inch	10½ inch	65 00
3½ inch	4	16 inch	12 inch	80 00
4⅞ inch	4	18 inch	13½ inch	95 00
5 inch	5	20 inch	15 inch	105 00
5½ inch	5	21 inch	16½ inch	110 00
6 inch	6	22 inch	18 inch	135 00
6½ inch	6	24 inch	19½ inch	145 00
7 inch	7	26 inch	21 inch	170 00
7½ inch	7	27 inch	22½ inch	180 00
8 inch	8	29 inch	24 inch	210 00
9 inch	9	32 inch	27 inch	250 00
10 inch	10	35 inch	30 inch	310 00

SPECIAL BEARINGS FOR QUILLS.

Diameter Shaft	No. Stand	Standard Length Bearing	Price
9 inch	9	21 inch	\$240 00
10 inch	10	22 inch	200 00
11 inch	10	24 inch	310 00
12 inch	12	26 inch	360 00
13 inch	12	29 inch	390 00
14 inch	14	32 inch	450 00

RIGID COLLAR OILING BEARING AND FLOOR STAND.

16¼ inches high to center of Shaft.

**Plate 977.**

Diameter Shaft	No. Stand	Standard Length Bearing	Special Length Bearing	Price
2½ inch	3	12 inch	9 inch	\$ 40 00
3¼ inch	3	14 inch	10½ inch	45 00
3½ inch	4	16 inch	12 inch	55 00
4¼ inch	4	18 inch	13½ inch	60 00
5 inch	5	20 inch	15 inch	75 00
5½ inch	5	21 inch	16½ inch	80 00
6 inch	6	22 inch	18 inch	100 00
6½ inch	6	24 inch	19½ inch	110 00
7 inch	7	26 inch	21 inch	135 00
7½ inch	7	27 inch	22½ inch	145 00
8 inch	8	29 inch	24 inch	175 00
9 inch	9	32 inch	27 inch	210 00
10 inch	10	35 inch	30 inch	260 00

SPECIAL BEARINGS FOR QUILLS.

Diameter Shaft	No. Stand	Standard Length Bearing	Price
9 inch	9	21 inch	\$195 00
10 inch	10	22 inch	235 00
11 inch	10	24 inch	245 00
12 inch	12	26 inch	295 00
13 inch	12	29 inch	315 00
14 inch	14	32 inch	375 00

DROP HANGER.**WITH BALL AND SOCKET COLLAR OILING BEARING.****HAVING LATERAL AND VERTICAL SCREW ADJUSTMENT.**

The Shaft can be placed in position or removed without disturbing the frame.

**Plate 978.**

No. Frame	Dia. Shaft	Standard Length	Drop	Price	No. Frame	Dia. Shaft	Standard Length	Special Length	Drop	Price
2	1 $\frac{1}{8}$	8	10	\$10 25	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	10	\$13 50
2	1 $\frac{1}{8}$	8	12	10 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	12	14 50
2	1 $\frac{1}{8}$	8	14	10 75	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	14	15 50
2	1 $\frac{1}{8}$	8	16	11 00	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	16	16 50
2	1 $\frac{1}{8}$	8	18	11 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	18	17 50
2	1 $\frac{1}{8}$	8	20	12 00	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	20	18 50
2	1 $\frac{1}{8}$	8	22	12 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	22	19 50
2	1 $\frac{1}{8}$	8	25	13 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	25	20 50
2	1 $\frac{1}{8}$	8	30	14 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	30	21 50
2	1 $\frac{1}{8}$	8	36	16 00	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	36	24 50
2	2 $\frac{1}{8}$	8	10	12 00	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	10	16 75
2	2 $\frac{1}{8}$	8	12	12 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	12	17 75
2	2 $\frac{1}{8}$	8	14	13 00	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	14	18 75
2	2 $\frac{1}{8}$	8	16	13 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	16	19 75
2	2 $\frac{1}{8}$	8	18	14 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	18	20 75
2	2 $\frac{1}{8}$	8	20	15 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	20	21 75
2	2 $\frac{1}{8}$	8	22	16 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	22	22 75
2	2 $\frac{1}{8}$	8	25	17 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	25	24 25
2	2 $\frac{1}{8}$	8	30	18 50	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	30	26 25
2	2 $\frac{1}{8}$	8	36	20 25	2	2 $\frac{1}{8}$	10	7 $\frac{1}{2}$	36	30 25

INVERTED DROP HANGER.

WITH BALL AND SOCKET COLLAR OILING BEARING.

HAVING LATERAL AND VERTICAL SCREW ADJUSTMENT.

The Shaft can be placed in position or removed without disturbing the frame.

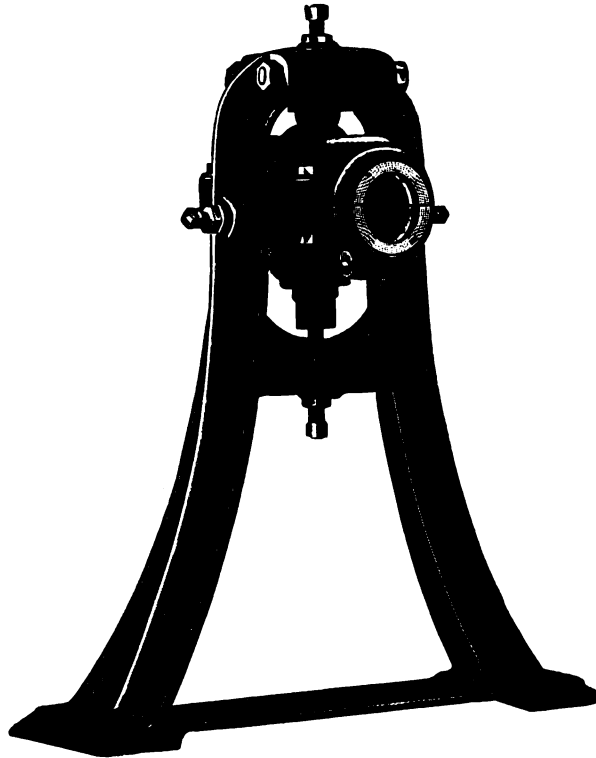


Plate 979.

No. Frame	Diam. Shaft	Standard Length	Special Length	Drop	Price	No. Frame	Diam. Shaft	Standard Length	Special Length	Drop	Price
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	14 . .	\$40 00	5 . .	5 . .	20 . .	15 . .	25 . .	\$73 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	16 . .	41 50	5 . .	5 . .	20 . .	15 . .	30 . .	80 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	18 . .	43 00	5 . .	5 . .	20 . .	15 . .	36 . .	90 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	20 . .	45 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	16 . .	74 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	22 . .	47 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	18 . .	76 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	25 . .	49 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	20 . .	78 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	30 . .	52 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	22 . .	80 00
4 . .	3 $\frac{1}{8}$	16 . .	12 . .	36 . .	57 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	25 . .	85 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	14 . .	49 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	30 . .	92 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	16 . .	51 00	5 . .	5 $\frac{1}{2}$	21 . .	16 $\frac{1}{2}$	36 . .	105 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	18 . .	53 00	6 . .	6 . .	22 . .	18 . .	20 . .	90 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	20 . .	55 00	6 . .	6 . .	22 . .	18 . .	22 . .	100 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	22 . .	57 00	6 . .	6 . .	22 . .	18 . .	25 . .	110 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	25 . .	60 00	6 . .	6 . .	22 . .	18 . .	30 . .	120 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	30 . .	64 00	6 . .	6 . .	22 . .	18 . .	36 . .	130 00
4 . .	4 $\frac{1}{8}$	18 . .	13 $\frac{1}{2}$	36 . .	70 00	6 . .	6 $\frac{1}{2}$	24 . .	19 $\frac{1}{2}$	20 . .	100 00
5 . .	5 . .	20 . .	15 . .	16 . .	62 00	6 . .	6 $\frac{1}{2}$	24 . .	19 $\frac{1}{2}$	22 . .	110 00
5 . .	5 . .	20 . .	15 . .	18 . .	64 00	6 . .	6 $\frac{1}{2}$	24 . .	19 $\frac{1}{2}$	25 . .	120 00
5 . .	5 . .	20 . .	15 . .	22 . .	66 00	6 . .	6 $\frac{1}{2}$	24 . .	19 $\frac{1}{2}$	30 . .	130 00
5 . .	5 . .	20 . .	15 . .	22 . .	68 00	6 . .	6 $\frac{1}{2}$	24 . .	19 $\frac{1}{2}$	36 . .	140 00

LIGHTNING ONE-MAN CROSS-CUT SAW.**Plate 980.**

Sizes 3, 3½, 4, 4½, 5, 5½ and 6 feet.

Lightning One-Man Cross-cut Saw, with new patent handle attached, for cutting wood, joist, logs and timber and sawing down trees. Complete, ready for use. Write for prices.

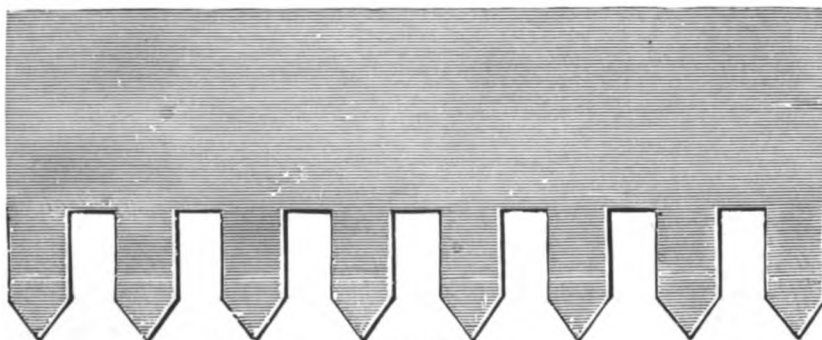
ALLIGATOR CROSS-CUT SAW.**Plate 981.**

Per foot. \$0 50
Handles, extra, per pair 50

TAPERED BUTTING OR DRAG SAW.**Plate 982.**

Warranted Extra Cast Steel.

Tapered 7 inch Butt, 5 inch Point, No. 10 Gauge, Plain, per foot \$0 90
Tapered 8 inch Butt, 6 inch Point, No. 10 Gauge, Plain, per foot 95
Equal Width, 8 inches, No. 10 Gauge, Plain 1 00
If set and sharpened, extra price. In ordering Drag Saws state whether mill-saw or cross-cut teeth.

LANCE TOOTH DRAG SAW.**Plate 983.**

Warranted Extra Cast Steel, Patent Tempered.

Gauge	7	8	9	10
9 inch wide, per foot . . . . .	.....	1 60	1 50	1 40
10 inch wide, per foot . . . . .	.....	1 80	1 70	1 60
12 inch wide, per foot	\$2 60	2 40	2 20	2 00
14 inch wide, per foot	3 30	3 00	2 70	2 40

PATENT TEMPERED CROSS-CUT SAWS.

COMMON TOOTH CROSS-CUT SAW.



Plate 984.

Per foot \$0 50

HOO K TOOTH CROSS-CUT SAW.



Plate 985.

Per foot \$0 50

CHAMPION CROSS-CUT SAW.



Plate 986.

Per foot \$0 50

The above Saws are ground two gauges thin on back. If ground four gauges thin on back the price is 60c. per foot.

Patent Cross-Cut Saw Handles for above Saws, 60c. per pair.

SOLID CIRCULAR SAWS.**PATENT GROUND AND TEMPERED.****Plate 987.**

Diameter, Inches	Size of Hole, Inches	Thick- ness, Gauge	Price of Each	Extra for each ad- ditional Gauge (heavier)	Prices for Beveling, extra each Gauge, per Gauge	Diameter, Inches	Size of Hole, Inches	Thick- ness, Gauge	Price of Each	Extra for each ad- ditional Gauge (heavier)	Prices for Beveling, extra each Gauge, per Gauge
4	$\frac{3}{4}$	19	\$ 0 90	\$0 03	\$0 14	36	$1\frac{1}{2}$	9	\$25 50	\$ 1 40	\$1 70
5	$\frac{3}{4}$	19	1 10	04	16	38	$1\frac{1}{2}$	9	30 00	1 75	1 85
6	$\frac{3}{4}$	18	1 30	05	18	40	2	9	35 00	2 00	2 00
7	$\frac{3}{4}$	18	1 50	06	20	42	2	8	40 00	2 50	2 20
8	$\frac{3}{4}$	18	1 75	08	22	44	2	8	52 50	3 00	2 40
9	$\frac{3}{4}$	17	2 00	10	25	46	2	8	50 00	3 50	2 60
10	$\frac{3}{4}$	16	2 30	12	28	48	2	8	70 00	4 00	2 80
11	1	16	2 65	14	30	50	2	7	80 00	4 50	3 00
12	1	15	3 00	17	35	52	2	7	90 00	5 00	3 25
14	$1\frac{1}{8}$	15	4 50	21	40	54	2	7	100 00	6 00	3 50
16	$1\frac{1}{8}$	14	5 50	25	50	56	2	7	115 00	7 00	3 75
18	$1\frac{1}{8}$	13	7 00	30	60	58	2	7	135 00	8 00	4 05
20	$1\frac{1}{4}$	13	8 50	35	70	60	2	6	160 00	9 00	4 35
22	$1\frac{1}{4}$	12	10 00	45	80	62	2	6	185 00	10 00	4 65
24	$1\frac{1}{4}$	11	12 00	55	90	64	2	6	210 00	12 00	5 00
26	$1\frac{3}{8}$	11	14 50	65	1 05	66	2	6	235 00	15 00	5 35
28	$1\frac{3}{8}$	10	16 00	80	1 20	68	2	5	260 00	18 00	5 75
30	$1\frac{1}{2}$	10	18 00	90	1 30	70	2	5	295 00	21 00	6 15
32	$1\frac{1}{2}$	10	20 00	1 00	1 40	72	2	5	335 00	24 00	6 55
34	$1\frac{1}{2}$	9	22 50	1 20	1 55						

Circular Saws to cut metal or ivory, 50 per cent advance. No extra charge for Saws one gauge thicker than list. Circular Saws beveled one gauge without extra charge up to 44 inches; 44 inches and larger, beveled two gauges without extra charge.

SOLID CIRCULAR SAWS.

RIGHT HAND SAW.

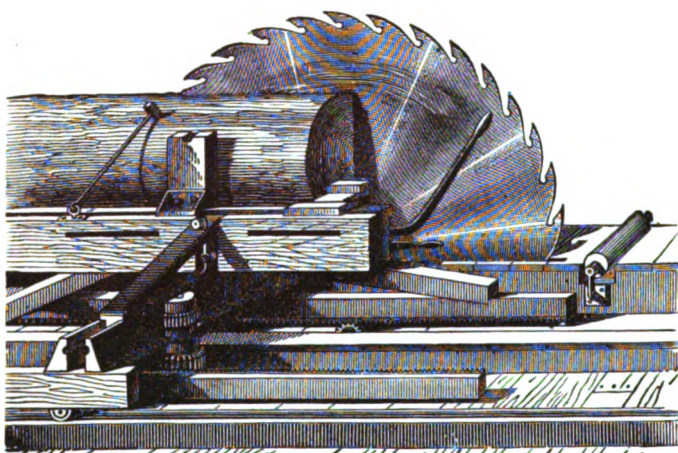


Plate 988.

LEFT HAND SAW.

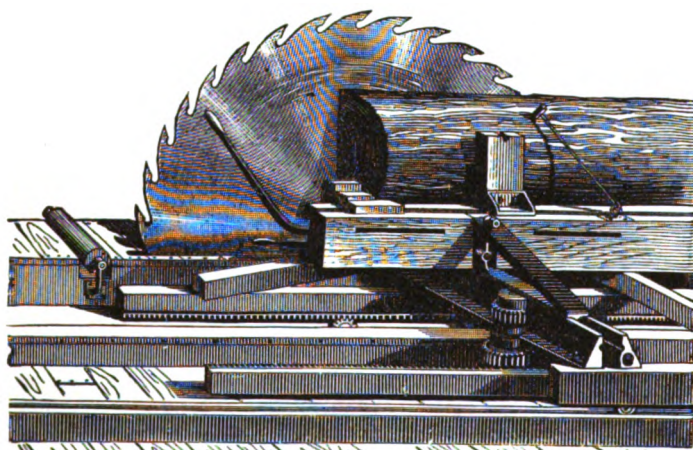


Plate 989.

INSTRUCTIONS FOR ORDERING.

Give following information when ordering Saws:

Say whether Cut-off or Rip Saw.

Size or diameter in inches.

Gauge at Eye.

Gauge at Rim.

Number of Teeth.

Size of Mandrel Hole.

Size of Pin Holes.

Distance from Center to Center of Pin Holes.

Greatest Feed.

Temper—State whether to swage or set.

Kind of Lumber Sawn.

Highest Speed of Saw.

Right or Left Hand (see engraving).

STANDARD SAW GAUGE.



Plate 990.

Gauge No. 4	is $\frac{1}{4}$ inch scant.	Gauge No. 9	is $\frac{1}{2}$ inch scant.
Gauge No. 5	is $\frac{3}{8}$ inch scant.	Gauge No. 10	is $\frac{1}{8}$ inch full.
Gauge No. 6	is $\frac{1}{2}$ inch full.	Gauge No. 11	is $\frac{1}{2}$ inch scant.
Gauge No. 7	is $\frac{3}{4}$ inch scant.	Gauge No. 12	is $\frac{1}{2}$ inch full.
Gauge No. 8	is $\frac{3}{4}$ inch scant.	Gauge No. 16	is $\frac{1}{2}$ inch full.

SPEED OF CIRCULAR SAWS.

Divide the number 36,000 by the diameter of saw in inches; the quotient will be the number of revolutions at which the saw should be run to secure best results.

SHINGLE AND HEADING SAWS.**LEFT HAND.****Plate 991.****RIGHT HAND.****Plate 992.****FIG. NO. 1.**

When ordering Shingle Saws give the following directions plainly: Diameter of Saw in inches; thickness or gauge of Saw at center; thickness or gauge of Saw at rim; full sketch or pattern of holes and sample of screw by which to drill and countersink Saw. If you have a flange send it to have holes drilled in Saw to fit flange. If you wish us to furnish the flange send full and correct sketch of diameter, thickness, holes, etc. State whose make of machine the Saw is to run upon, number of teeth you wish in the Saw, and be sure to give flat or countersunk side and the direction in which the teeth run (see engraving above.)

Particular attention is also called to the importance of using screws that are suitable to the thickness of the Saws. We frequently receive Screws as samples by which to drill and countersink that have heads entirely too large for the thickness of Saw, and which require the flange to be countersunk (as shown in Fig. 1), thereby reducing the length of thread in flange, making it impossible to bind the Saw firmly to flange.

FIG. NO. 2.

Fig. 2 shows the correct size the screw heads should be, thus getting a good bearing for the screw heads on countersink in Saw, and full thickness of flange is retained for thread.

In no case should screw heads be deeper than thickness of Saw. Thin Saws require smaller screw heads than thick Saws.

WARRANTED EXTRA CAST STEEL SHINGLE AND HEADING SAWS.**TAPERED AND PATENT GROUND.**

30	32	34	36	38	40	42	44	46	48	50	52	54	56 in.
\$26 00	29 00	32 00	35 00	40 00	46 00	56 00	67 00	78 00	90 00	104 00	120 00	140 00	160 00

WARRANTED EXTRA FINE CAST STEEL PATENT EDGER SAWS.**PATENT TEMPER, PATENT GROUND.**

	16	18	20	22	24 in.
10 Gauge	\$6 00	6 50	8 20	9 00	10 50
9 Gauge	6 25	7 00	8 60	9 50	11 25
8 Gauge	6 50	7 50	9 00	10 00	12 00

MIXTER'S TOOTH SWAGE AND SHARPENER.



Plate 993.

No. 0, for small, thin Saws, weight, 5 oz., each	\$4 00
No. 1 Swage, for Saws from 12 to 16 gauge, weight, 10 oz., each	5 00
No. 2 Swage, medium size, for Saws of from 8 to 12 gauge, weight, 1 lb., each	6 00
No. 3 Swage, large size, for Saws of from 5 to 10 gauge, weight, 1½ lbs., each	7 00

MIXTER'S CELEBRATED CHAMPION GUMMERS.

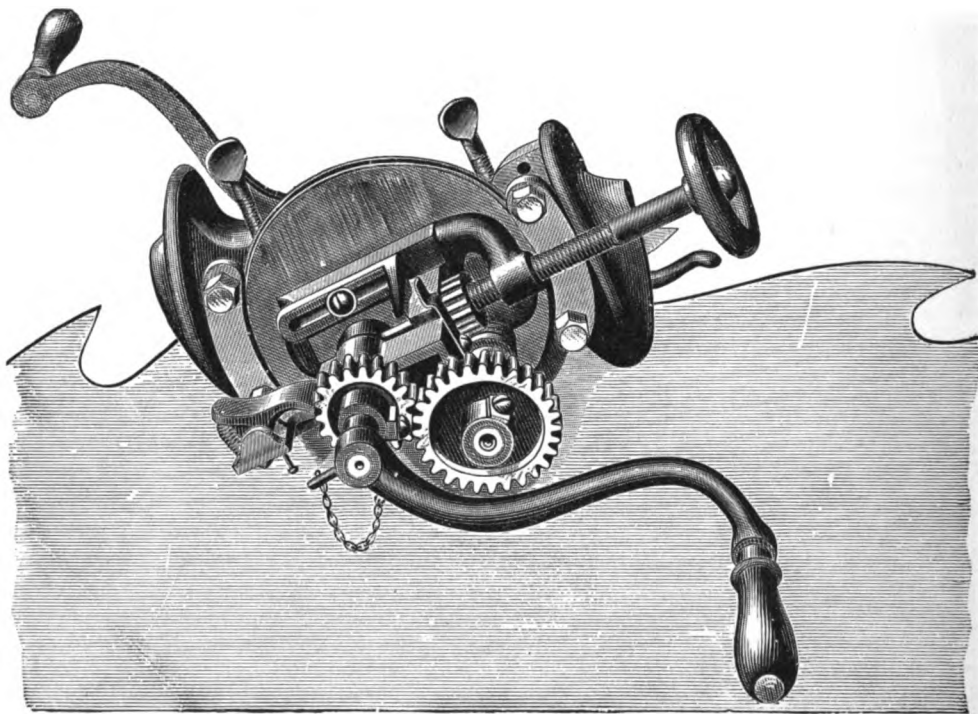
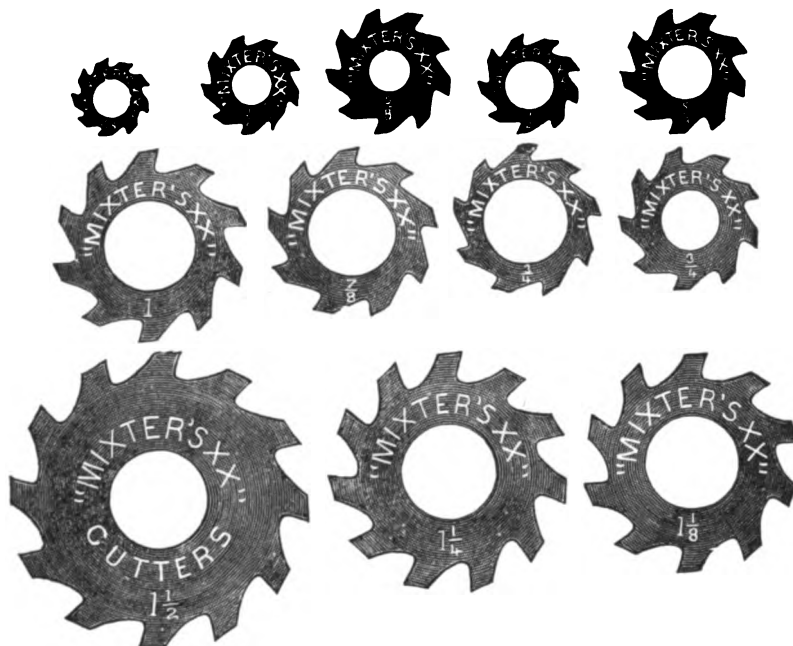


Plate 994.

Price of Gummer, with the patent Automatic Feed Attachment, three Cutters, Grinder and Wrench, \$30 00	
¾ inch Cutters for Champion Gummer	60
⅞ inch Cutters	70
1 inch Cutters	80
1⅛ inch Cutters	90
1¼ inch Cutters	1 00
1½ inch Cutters	1 25
Extra Arbors for ½ and ⅝ inch Cutters for Champion Gummings	2 00

MIXTER'S XX CUTTERS.

End View, Showing the Diameter of Cutters from $\frac{3}{8}$ inch up to $1\frac{1}{2}$ inch.

**Plate 995.**

The holes in above Cutters are as follows: $\frac{3}{8}$ -inch Cutters, $\frac{1}{8}$ -inch holes; $\frac{1}{2}$ and $\frac{5}{8}$ -inch Cutters, $\frac{1}{8}$ or $\frac{1}{4}$ -inch holes; $\frac{3}{4}$ -inch Cutters, $\frac{1}{4}$ or $\frac{1}{2}$ -inch holes; $\frac{7}{8}$ to $1\frac{1}{2}$ -inch Cutters, $\frac{1}{2}$ -inch holes.

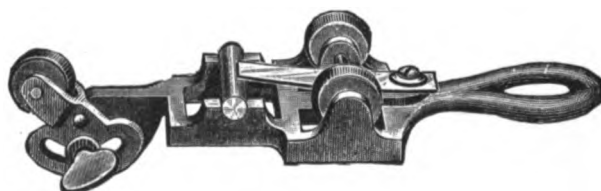
Extra arbors for the Champion Self-Feed Gummer are made to fit both sizes holes, $\frac{1}{8}$ and $\frac{1}{4}$, as per list above.

Size	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.	$\frac{3}{4}$ in.	$\frac{7}{8}$ in.	1 in.	$1\frac{1}{8}$ in.	$1\frac{1}{4}$ in.	$1\frac{1}{2}$ in.
Price	\$0 50	0 50	0 50	0 60	0 70	0 80	0 90	1 00	1 25

Extra arbors for $\frac{3}{8}$ -inch Cutters, with $\frac{1}{8}$ -inch hole, \$2.00. Extra arbors, for $\frac{1}{2}$ -inch and $\frac{5}{8}$ -inch Cutters, with $\frac{1}{4}$ -inch hole, \$2.00.

HOW TO ORDER CUTTERS.

Order Cutters sent by mail. Give size of Cutter required, or send an impression of one end of the Cutter on paper.

IMPROVED CUTTER GRINDERS.**Plate 996.**

Grinds the Cutters perfectly round.

Price \$1 00

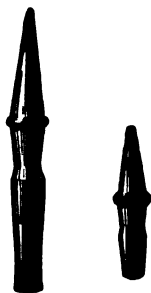


Plate 997.

BOOT CALKS.**FOR RAFTERS.**

Beaded Ball Calks, small, per 1,000	\$ 8 00
Beaded Ball Calks, medium, per 1000	9 00
Beaded Ball Calks, large, per 1000	10 00
Beaded Heel Calks	12 00

PIKE POLES.**FOR RIVER DRIVING.****WHITE ASH POLES.**

Plate 998.

	Per doz.		Complete, per doz.
10 feet long, with pike and rings	\$14 00	10 feet long, with pike, hook and rings . .	\$16 00
12 feet long, with pike and rings	15 00	12 feet long, with pike, hook and rings . .	17 00
14 feet long, with pike and rings	16 00	14 feet long, with pike, hook and rings . .	18 00
16 feet long, with pike and rings	18 00	16 feet long, with pike, hook and rings . .	20 00
18 feet long, with pike and rings	22 00	18 feet long, with pike, hook and rings . .	24 00
Pikes and rings only, \$9.00 per dozen.		Pikes, hooks and rings only, \$10.50 per dozen.	

HAND SPIKES.

Plate 999.

Maple or hickory stocks. Spike $\frac{7}{8}$ inch square.

5 feet long, per doz . . . \$16 00	5½ feet long, per doz . . . \$17 00	6 feet long, per doz . . . \$18 00
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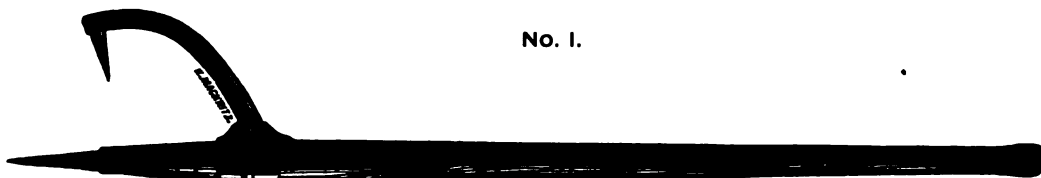
PERFECTION CANT HOOKS AND PIKE POLES.**No. 1.**

Plate 1000.

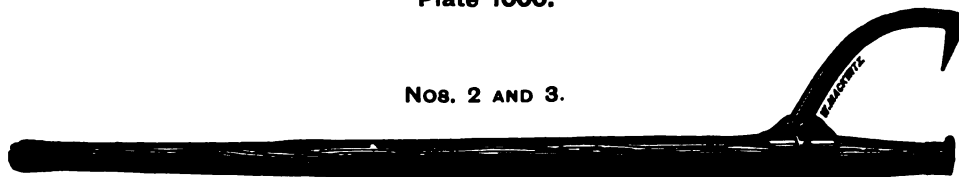
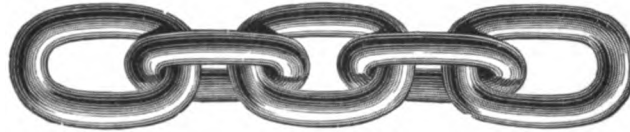
Nos. 2 and 3.

Plate 1001.

		Stock.	Length of Handle.	Size of Hook.	Diameter of Handle.	Price per Doz.
No. 00	For small logs, telegraph poles, bridge timbers, etc.	Hickory . .	4 feet	1¾ long x ¾ base . .	2¼ inch.	\$20 00
No. 1	For river driving, with pike ¾ in. square	Maple . . .	5½ and 6 feet . .	2¾ long x ¾ base . .	2½ inch.	81 00
No. 2	For light mill use	Hickory . .	4½ feet	2¼ long x ¾ base . .	2½ inch.	22 00
No. 8	For large logs	Maple or Hickory . .	5 and 5½ feet . .	2½ long x ¾ base . .	2¾ inch.	25 00

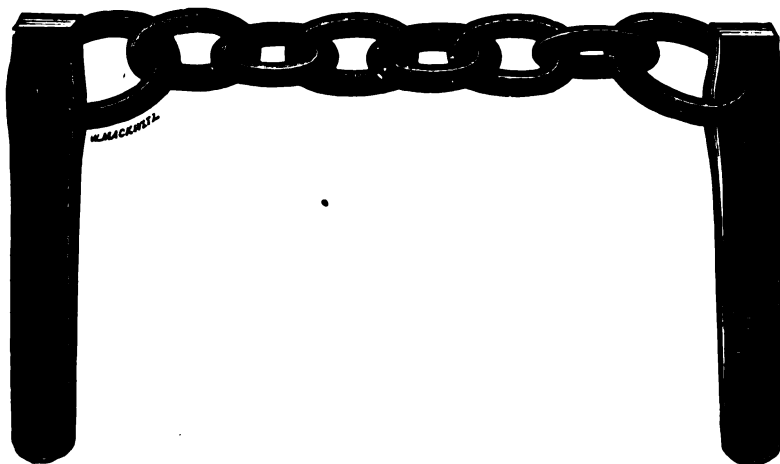
Extra Stocks for Nos. 00, 2 and 3, per doz., \$6 00; for No. 1, per doz., \$7 00.

When ordering extra handles, please say for what number of Cant Hook they are to be used.

CHAINS.**NO. 80. STRAIGHT COIL.****Plate 1002.****NO. 81. TWIST COIL.****Plate 1003.****WEIGHT AND STRENGTH OF CHAINS.**

Size	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$ in.
Weight per foot . . . . .	.17	.38	.67	1.08	1.55	2.11	2.70	3.42
Safe Weight in pounds	250	560	1,000	1,560	2,250	3,050	4,000	5,050
Size	$\frac{5}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{8}$	1 in.
Weight per foot	4.00	4.84	5.75	6.00	7.83	9.40	10.07	
Safe Weight in pounds	6,250	7,550	9,000	10,500	12,250	14,000	16,000	

Straight or Twist, same price, to $1\frac{7}{8}$ inclusive. Write for prices.

CHAIN DOGS.**Plate 1004.**

Made of $1\frac{1}{8}$ inch chain, 10 inches long, per 100 \$.....

Made of $\frac{3}{8}$ x 1 inch iron and 6 inches long. Special sizes to order.

BRIGHT LOG CHAIN.

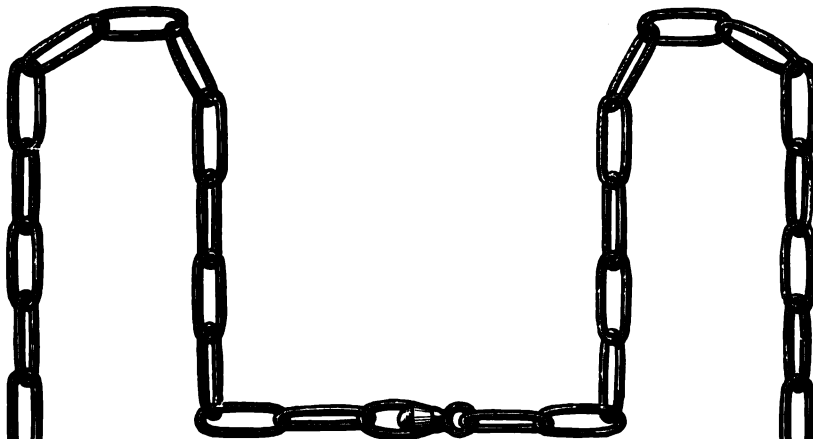


Plate 1005.

WITH SWIVEL, TWO HOOKS OR HOOK AND RING. ASSORTED LENGTHS.

Sizes	$1\frac{5}{8}$	$\frac{3}{8}$	$1\frac{7}{8}$	$\frac{1}{2}$	$1\frac{9}{8}$	$\frac{5}{8}$
Length, feet .	9 to 15	9 to 15	9 to 15	9 to 15	9 to 15	9 to 15
Price, per lb .	.....	.....	.....	.....	.....	.....

Extra lengths made to order.

We can furnish to order any kind, size or weight of chain suitable for rafting, booming or hauling up logs in mill. Prices on application.

RING DOGS.

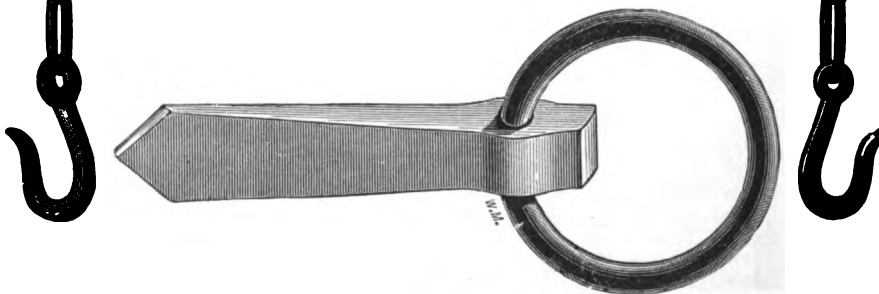
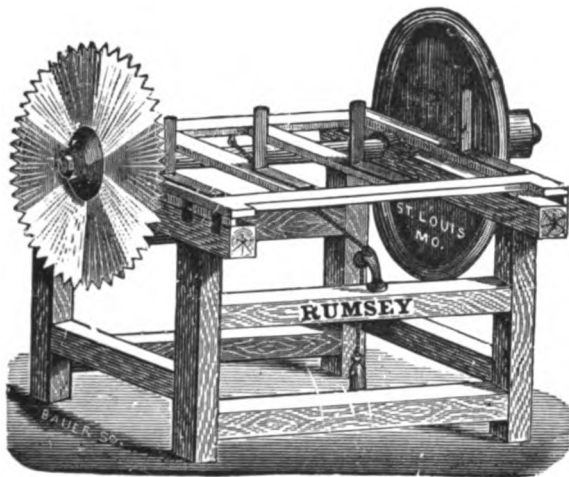


Plate 1006.

One inch square iron, 7 inches long. Ring of $\frac{1}{2}$ -inch iron, 3 inches inside diameter. Special sizes to order.

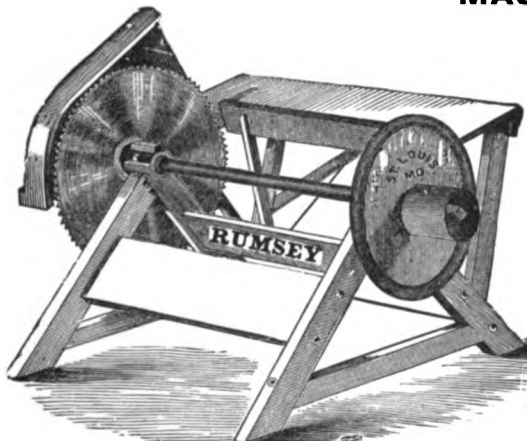
Owing to frequent fluctuations in prices, we give estimates on application.

SLIDE TABLE WOOD-SAWING MACHINE.**Plate 1007.**

This cut represents our Slide Table 24-inch Saw, a machine in general use for sawing wood for fuel. The wood is placed on the sliding frame on the top of the machine, against the small uprights, and then pushed with the frame to the saw; when cut, the frame with the stick is withdrawn and ready for renewed operation. It is easily driven by one or two-horse power. The boxes have oil cups and covers to protect the journals from dust and dirt. The saws are filed and set ready for use.

Mandrel, 4 feet 2 inches long; shipping weight, 310 pounds; pulley, 6x6 inches.

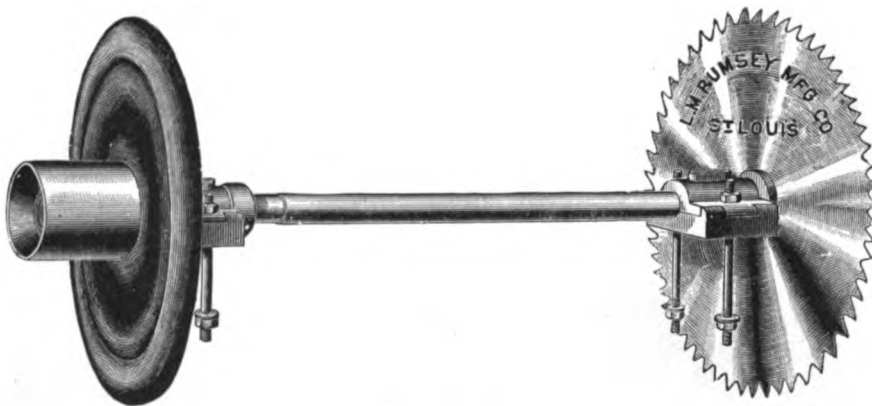
Price, with 24-inch saw \$65 00

RUMSEY'S IMPROVED SWING TABLE WOOD-SAWING MACHINE.**Plate 1008.**

This cut shows our Improved Swing Table, 24-inch Saw, for sawing wood. The Table is just balanced, swinging on centers, as will be seen in the cut. It is very easy for the operator, who only has to lay the timber or wood on the table and swing it to the saw, which is a great improvement on the slide table. They are extensively used by railroads, wood-yards, etc. All of our saws have oil cups and covers to protect the bearings from dirt and dust, thereby making them more durable. The saws are filed and set ready for use.

Mandrel, 4 feet 2 inches long; shipping weight, 310 pounds; pulley, 6x6 inches.

Price, with 24-inch saw \$68 00

**Plate 1009.**

To parties desirous of building their own Cordwood Saw-Table, we can furnish the irons complete as follows: Shaft, 1½ inch diameter by 50 inches long; pulley, 6-inch diameter 7-inch face; balance wheel, boxes, stirrups and cross-cut saw 20 to 24 inches diameter.

Weight complete, as above, 165 pounds, price, \$40.00; Weight complete, less saw, 150 pounds, price, \$28.00.

RUMSEY IRON DRAG SAW. THE CULVER PATENT.

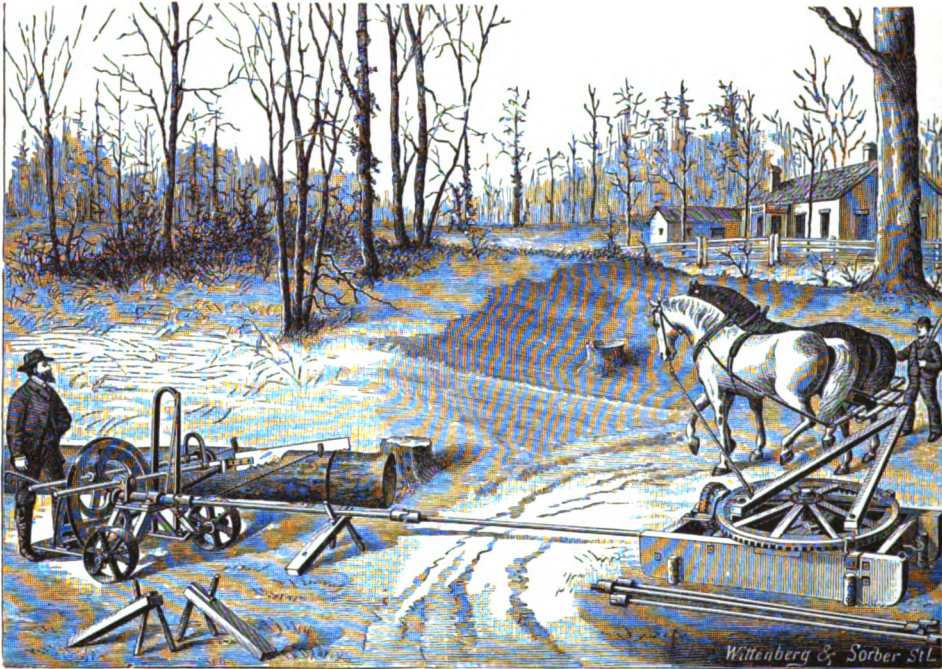


Plate 1010.

A wrought iron frame, mounted on wheels, to which the saw is attached, is moved along the log by means of an extension shaft as each cut is sawed off. This obviates the necessity of moving either the power or the log, and saves three-fourths of the labor. Four other shafts are also furnished. It can be used on soft or uneven ground, or on a hillside.

When at work the machine is securely held to the log by two dogs, as shown in the cut.

The double joints at each end of the different tumbling shafts allow the machine to saw at an angle with the power.

One horse will do equally as good work on small timber as two.

Weight of Power and Saw, 1,100 pounds. Weight of Saw Jacks, only 300 pounds. Weight of Saw Jacks and Tumbling Rods, 500 pounds.

For efficient work the speed should be forty-seven of shaft to one of the horse, or 150 revolutions per minute of fly wheel.

Rumsey Iron Drag Saw, with power and shaft complete	\$110 00
Rumsey Iron Drag Saw, complete, less horse power	75 00
Rumsey Iron Drag Saw, Jack, only, with 5-foot saw	50 00

IMPROVED DRAG SAW MACHINE. FOR POWER.

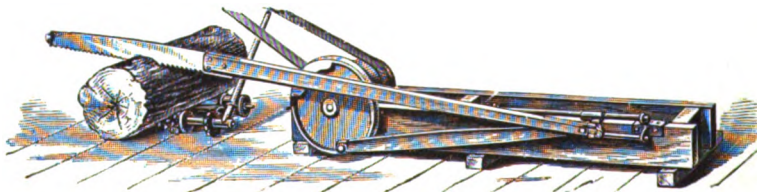


Plate 1011.

Will cut from ten to fifteen thousand feet of logs into 42-inch lengths in ten hours, and other lengths correspondingly. Speed, 200. Pulleys, tight and loose, 24 inches in diameter and 5 inches face. Write for prices.

THE KENTUCKY DRAG SAW.

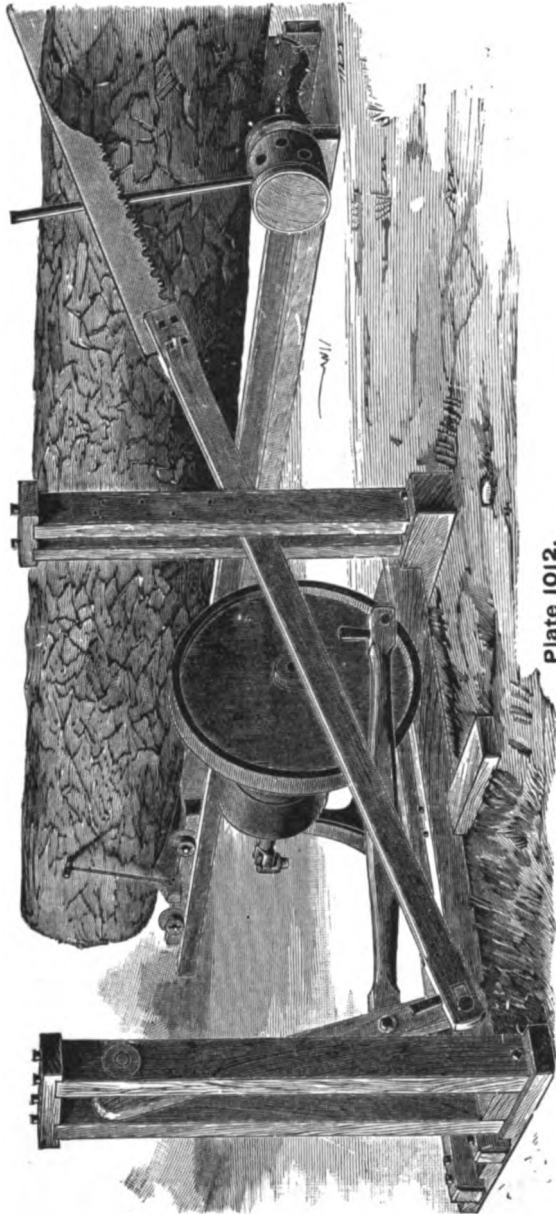


Plate 1012.

This cut represents our New Kentucky Drag Saw. Frequent inquiries and a growing demand for a cheap, simple and effective Drag Saw, led us to design the accompanying machine, which we believe will meet the wants of farmers and mill men who desire a first-class Drag Saw.

The advantages of this machine over others are:

1. Extreme simplicity.
2. A swing motion to the Saw which gives a rounding cut and clears the saw-dust from the opening as fast as formed.
3. There are no slides to wear and need greasing.
4. It runs easily at the expense of very little power.
5. It has a heavy crank wheel ensuring regular motion.
6. It has both a tumbling shaft connection, and also 12 x 4 inch face tight and loose pulleys, so that it can be run by tumbling shaft or belt. Fly-wheel should make from 150 to 175 revolutions per minute.

Weight, 545 lbs.

Without Power, with 5½ foot Saw \$50 00

RUMSEY SAW MILL.

RUMSEY NO. 1 SINGLE SAW MILL.

(RIGHT HAND.)

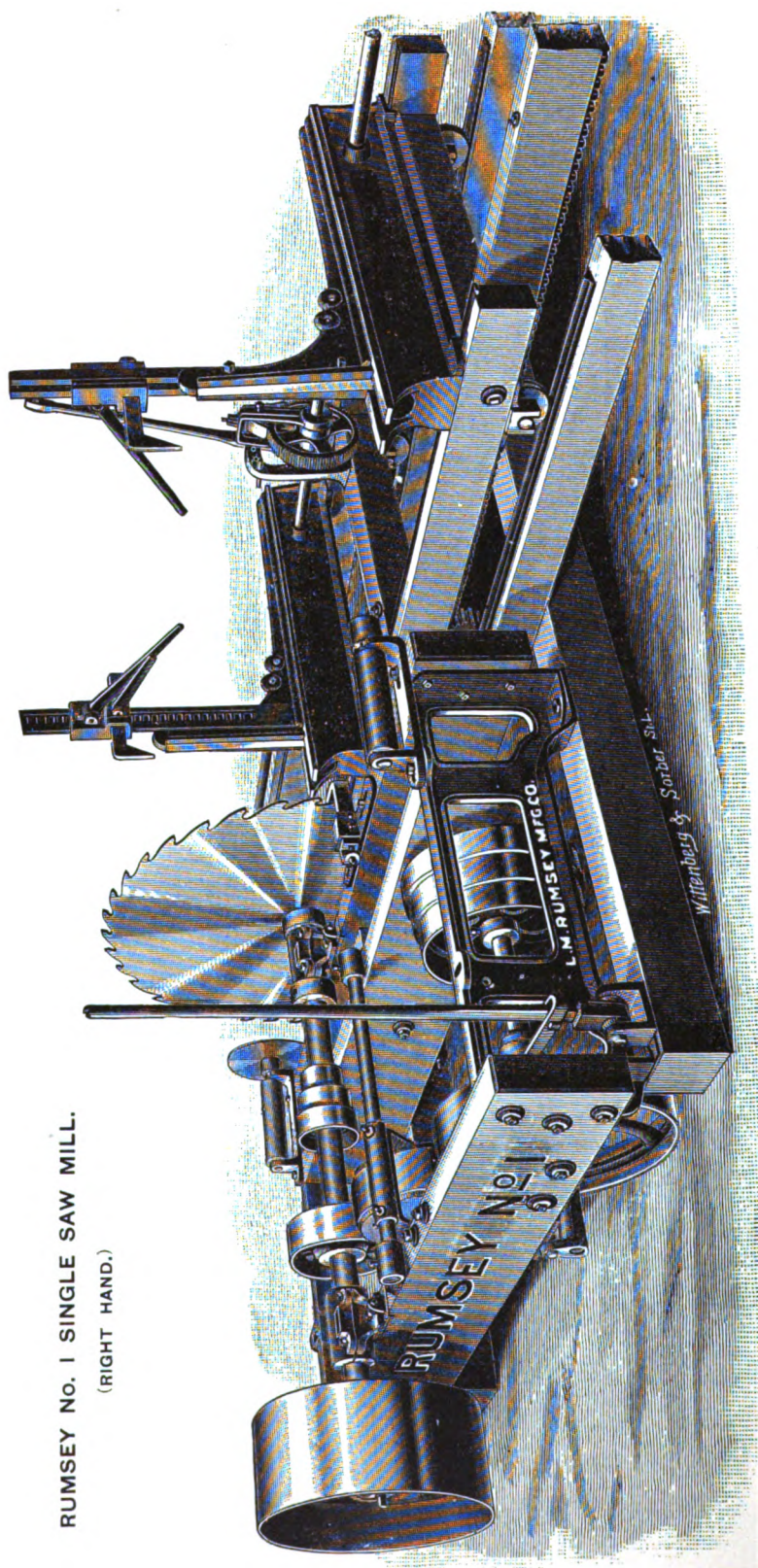


Plate 1013.

The Nos. 1, 2 and 3 Mills are built both Double and Single.

RUMSEY SAW MILLS.

DESCRIPTION OF THE RUMSEY SAW MILLS, Nos. 0, 1, 2 AND 3.

The Husk Frames are made from seasoned yellow pine, having extra heavy iron ends with timbers securely bolted to them.

The Mandrels are of the best quality steel, of large diameters, and have solid welded collars, with improved self-oiling boxes of extra length, lined with best quality Babbitt.

We use the straight Spur Friction Feed, which we consider superior to any other for this class of Mills, being free from complication and consequent expense in the way of repairs.

The Carriages are made of seasoned yellow pine, are heavy and substantial and securely bolted together, and the wheels are cast in specially turned chills, ensuring smooth, hard surfaces.

The Head Blocks are the Rack and Pinion pattern of the simplest and latest design, having heavy bases and large working range, and will be fitted with either the old style Mallet dog or our Champion dog, as may be wanted.

SPECIFICATIONS.

Number of Mill.	Diam. of Mandrel.	Length of Mandrel.	Length of Mandrel Boxes.	Width of Husk Frame.	Length of Husk Frame.	Depth of Husk Frame.	Thickness of Timber.	Size of Drive Pulley.	Face of Frictions.	Diameter of Rack Shaft.	Length of Carriage.	Size of Rollers.	Size of Axles.	Length of Rack Stick.	Opening of Blocks to Saw.	Size of Saw that Mill will carry.	Power Required.	Capacity per day in Feet.	Price, without Saw.	With Top Saw Attachment, without Saw.	Extra Head Blocks, Each.	Extra Carriage, per Foot.	Shipping Weights, in Pounds.
0	2 7/8	4 10	8	3 1	7 5	11 1/2	3 1/2	20x10	4	1 1/2	18	6	1 1/4	24	36	52	In.	8 to 10	\$200 00	.....	\$30	\$2 75	2,800
1	2 3/4	6	8	4 1	8	12	4	24x10	4	1 1/2	20	6	1 1/4	26	36	54	In.	10 to 15	225 00	\$325 00	30	3 00	3,500
2	2 1/2	6 7	8	4 11	8 6	12	4	24x12	5	1 3/4	24	6	1 1/2	30	36	60	In.	12 to 20	275 00	375 00	30	3 50	4,000
3	3 1/2	7	10	5 2	9	14	5	24x14	6	2 1/4	24	8	1 3/4	30	40	66	In.	20 to 40	500 00	625 00	65	5 25	5,500

We reserve the right to make any alterations in the specifications with a view of improving the working or durability of the Mill. Changes in driving pulleys made without extra charge, if ordered with the Mill.

If desired, these Mills can be fitted with Sawyer's Lever, so that the same operator can both set the logs and handle the carriage.

With each Mill we furnish Track Iron, Wrenches, Leather Feed Belt, Upset and Oil Can, without extra charge. Anything else furnished is charged for as an extra.

The capacities, as given, depend, of course, entirely upon the amount of power available, the kind of timber and the management and skill of the operator.

In ordering, be sure to give the amount of power to be used, the size and speed of the Driving Pulley, the size and gauge of the Saw, also whether Right or Left hand Mill is wanted, and the character of the work to be done. State fully just what you want, and give length and size as near as possible of the logs to be cut.

SELF-FEED SHINGLE MACHINE.

"C."

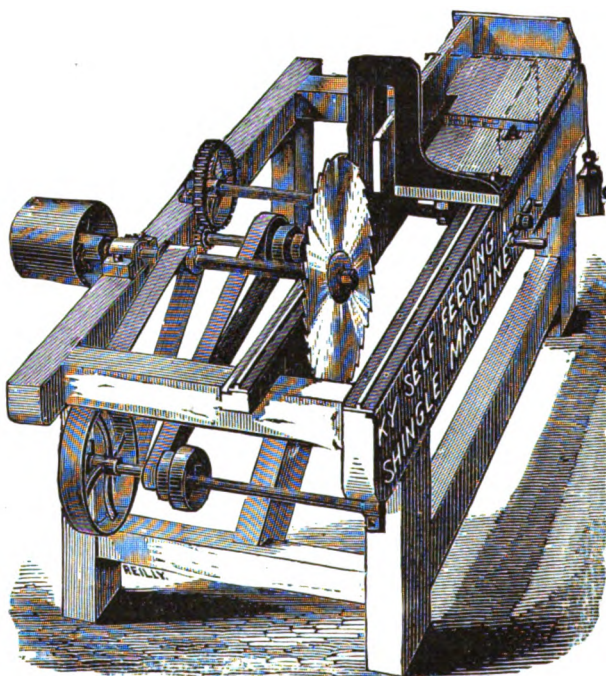


Plate 1014.

The above cut illustrates our New and Improved Self-Feed Shingle Machine, which has been greatly improved this season. The slide has been stiffened by the Cast Iron Yoke shown in the cut, and four Wrought Iron Gibs attached to the under part. The ways are planed smooth underneath to allow the Gibs on the slide to slip thereon, thus firmly holding the shingle table or slide. We have also introduced a Self-Acting or Automatic Trip to stop the slide the instant the cut is made, and allow the weight to bring the shingle table back. All the operator has to do, is to rock the block with his hands, and throw it in gear. It will square riven blocks. The mandrel should have 1,500 revolutions per minute to do the most satisfactory work. All the inside Belts, a Wrench, and one 24 inch Saw (made expressly for this Machine, filed and set as it should be) are furnished.

Pulley, 8 x 8 inches. Capacity, 5,000 to 8,000 shingles per day.

Complete, as above, weight, 450 lbs.	\$100 00
With Regular Saw Table and Gauge for sawing Palings, Strips, etc., weight, 500 lbs.	115 00
Hand-Feed Machine, weight, 300 lbs.	50 00
Hand-Feed Shingle and Lath Machine Combined, with two 12 and one 24 in. Saw, weight, 350 lbs.	75 00

LUMBER WHEELS AND CARS.

(OUT SHOWING COMPLETE CAR.)

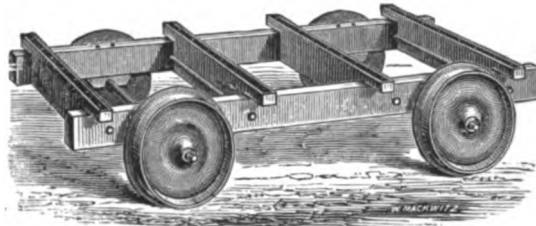


Plate 1015.

See prices below on iron work only.

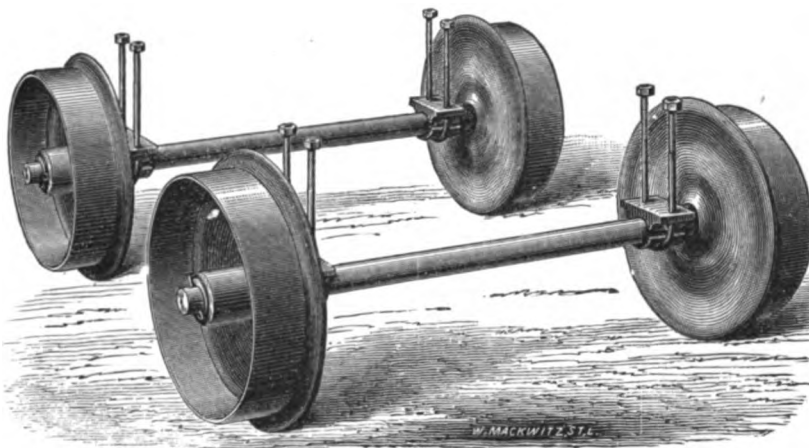


Plate 1016.

	Per Set
10 inch Flanged Wheels and Axles	\$12 00
12 inch Flanged Wheels and Axles, light, for lumber	15 00
12 inch Flanged Wheels and Axles, heavy, for logs	18 00
16 inch Flanged Wheels and Axles, light, for lumber	20 00
16 inch Flanged Wheels and Axles, heavy, for logs	23 00
20 inch Flanged Wheels and Axles, heavy	38 00
24 inch Flanged Wheels and Axles, heavy	48 00

Above prices are for irons only (no woodwork), consisting of four Wheels, two Axles and four Stirrups. Our Wheels have wide Tread, and are very heavy and strong. Wheels are bored and drilled, and run loose on Axle.

We furnish Car complete as represented in the cut, at prices given on application. Inquiries should state diameter of Wheels desired.

LUMBER BUGGY WHEELS AND AXLES.

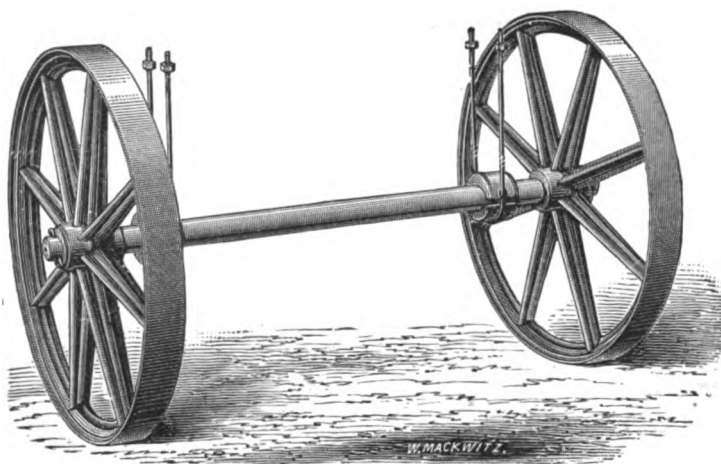


Plate 1017.

The wheels are $24\frac{1}{2}$ inches diameter, $2\frac{1}{2}$ inches face.

The tire is made of heavy wrought iron, shrunk on a heavy casting.

Distance between wheels, 31 inches. Axle, $1\frac{3}{4}$ inches. Body is usually made 8 feet long.

We furnish irons complete, comprising two wheels and axle, stirrups, rods and top plates, for . . . \$12 00

Two 30-inch wheels, $3\frac{1}{2}$ -inch face, 2-inch axle, 3 feet 3 inches long, complete as above 16 50

LUMBER BUGGIES.

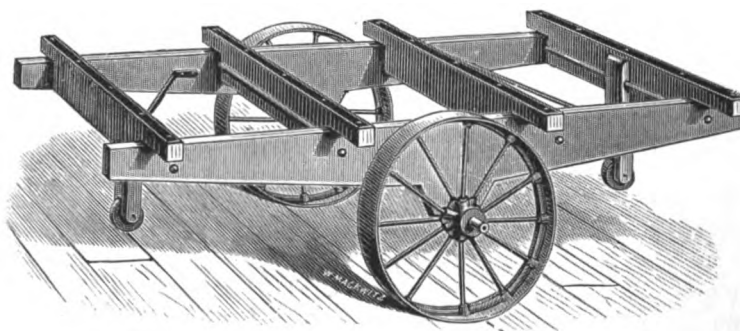
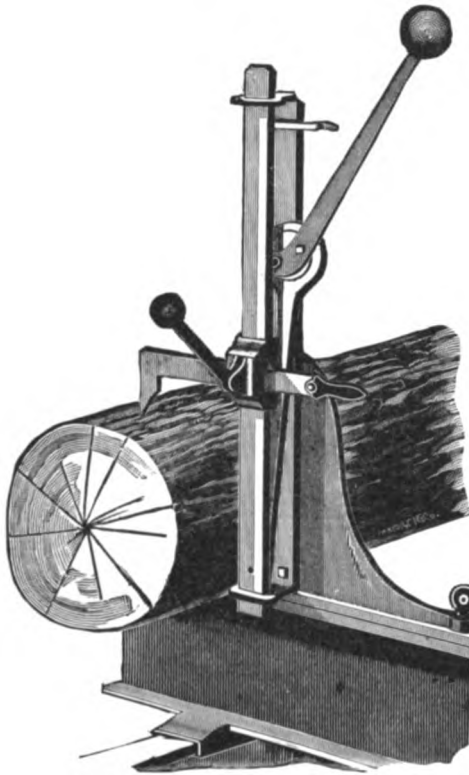
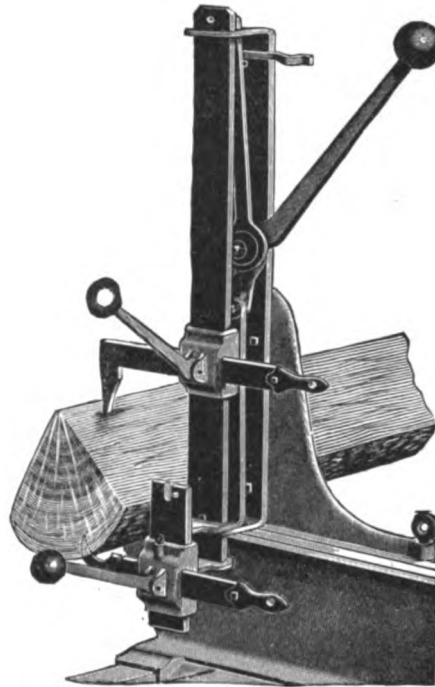


Plate 1018.

Our regular stock buggy is 8 feet in length and 3 feet wide. Frames of selected yellow pine, provided with wheels 26 inches in diameter, 3-inch face and wrought iron spokes loose on axle.

Price, each \$25 00

We make any size and weight of above that may be desired.

STANDARD PATENT SAW MILL DOGS.**SINGLE DOG.****No. 1.****Plate 1019.****DUPLEX DOGS.****No. 2.****Plate 1020.****SINGLE DOG—PLATE 1019.**

Standard . . height, 40 inches; size of Upright Bar, 3 inches wide, $\frac{1}{2}$ inch thick; weight, per pair, 140 lbs.
 Medium . . height, 40 inches; size of Upright Bar, 3 inches wide, $\frac{5}{8}$ inch thick; weight, per pair, 160 lbs.
 Large . . . height, 40 inches; size of Upright Bar, 3 inches wide, $\frac{3}{4}$ inch thick; weight, per pair, 185 lbs.

DIRECTIONS FOR ATTACHING THEM.

It is only necessary to drill two $\frac{1}{2}$ inch holes through the standard or knee, and bolt the dog firmly to the same, as shown in cut. They should be set far enough back from the face of the knee, when used on double mills, to allow the frame of the dog to pass the nut or end of top saw arbor, when holding the last piece, or 1 inch on the carriage. The bottom of the dog should be two inches from the top of the head block, to allow the upright bar to work down when dogging the log.

DUPLEX DOG—PLATE 1020.

Plate 1020 represents a Duplex Dog for holding the log above and below, and is used principally in sawing quarter stock or other irregular piece stuff. The lower attachment is bolted fast to the opposite side of the knee from which the dog itself is attached, and can be readily disconnected and the upper dog used alone, same as the regular dog. They will hold the log in any position you may want it. The log can be lifted from the head block and hung entirely on the dogs, and they will hold it firmly while being sawed, as if in a vise.

ONLY MADE TO ORDER.

They are manufactured upon special orders only, as the dimensions of the knee must be given, so the dogs can be made to fit.

In giving dimensions, make a paper pattern of the knee, full size, and give thickness of knee, four inches back from the face of knee, also the height and width of the head block. With these dimensions properly given, we make the dogs at factory so they will fit, and ready to be bolted to the knees.

THE NORTON EMERY AND CORUNDUM WHEELS, CYLINDERS AND CUP WHEELS.

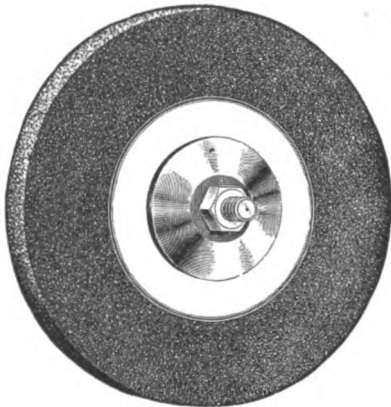


Plate 1021.

L. M. RUMSEY MFG. CO.,
SOUTHWESTERN
AGENTS.

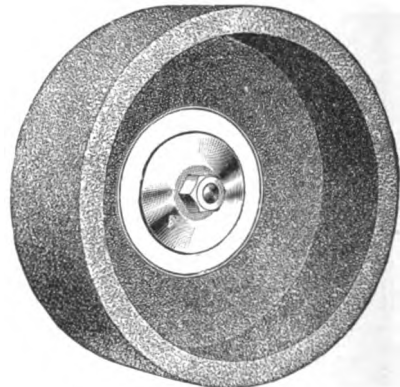


Plate 1022.

These goods contain nothing but cutting properties; are free from dust or smell; will not glaze or fill up; are of great endurance on hard work, and will work equally well wet or dry.

In ordering be sure to state what kind of work the wheel will be used for. Also carefully give the diameter and thickness, and the size of hole.

Take notice, that wheels should be hung with flanges slightly concaved, of good size, using rubber or leather washers. Great care should be taken to keep the wheels perfectly true, and in mounting they should slip easily on the mandrel, and have flanges screwed only tight enough to prevent slipping.

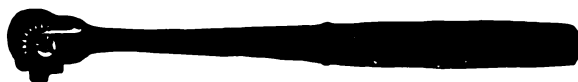
Diam-eter, Inches	Thickness of Wheels,													Revolutions per Minute.	
	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.	Min.	Max.
1	\$0 25	30	30	35	35	40	45	50	60	70	80	90	1 00	13,000	18,000
$1\frac{1}{2}$	30	35	40	45	45	50	55	60	70	80	90	1 00	1 10	10,500	14,000
2	35	45	50	55	55	60	65	70	80	90	1 00	1 10	1 20	7,900	11,000
$2\frac{1}{2}$	40	55	65	70	75	85	95	1 05	1 25	1 45	1 65	1 85	2 05	6,330	8,800
3	50	65	80	85	95	1 10	1 25	1 40	1 70	2 00	2 30	2 60	2 90	5,275	7,400
$3\frac{1}{2}$	60	80	95	1 05	1 15	1 35	1 55	1 75	2 15	2 55	2 95	3 35	3 75	4,500	6,300
4	75	95	1 10	1 25	1 35	1 60	1 85	2 10	2 60	3 10	3 60	4 10	4 60	3,950	5,500
$4\frac{1}{2}$	90	1 10	1 25	1 40	1 55	1 85	2 15	2 45	3 05	3 65	4 25	4 85	5 45	3,500	4,900
5	1 00	1 20	1 40	1 60	1 80	2 20	2 60	3 00	3 80	4 60	5 40	6 20	7 00	3,160	4,400
6	1 40	1 60	1 75	2 15	2 40	3 05	3 70	4 35	5 65	6 95	8 25	9 55	10 85	2,640	3,700
7	1 85	2 00	2 15	2 75	3 00	3 85	4 70	5 55	7 25	8 95	10 65	12 35	14 05	2,260	3,160
8	2 10	2 35	2 60	3 10	3 60	4 60	5 60	6 60	8 60	10 60	12 60	14 60	16 60	1,980	2,770
9	2 50	2 80	3 10	3 50	4 25	5 40	6 55	7 70	10 00	12 30	14 60	16 90	19 20	1,760	2,460
10	3 00	3 30	3 65	4 40	5 00	6 35	7 70	9 05	11 75	14 45	17 15	19 85	22 55	1,580	2,210
12	3 60	3 80	4 00	5 00	6 00	7 40	9 00	10 70	14 00	17 40	20 75	24 25	27 50	1,320	1,850
14	.....	.....	6 25	7 45	8 45	10 65	12 85	15 05	19 45	23 85	28 25	32 65	37 05	1,130	1,580
16	.....	.....	.....	.....	10 85	13 70	16 55	19 40	25 10	30 80	36 50	42 20	47 90	990	1,380
18	.....	.....	.....	.....	13 25	17 00	20 75	24 50	32 00	39 50	47 00	54 50	62 00	880	1,230
20	.....	.....	.....	.....	.....	20 25	24 75	29 25	38 25	47 25	56 25	65 25	74 25	790	1,100
22	.....	.....	.....	.....	.....	25 00	31 00	37 00	49 00	61 00	73 00	85 00	97 00	720	1,000
24	.....	.....	.....	.....	.....	29 00	36 00	43 00	57 00	71 00	85 00	99 00	113 00	660	920
26	.....	.....	.....	.....	.....	.....	43 00	51 00	67 00	83 00	99 00	115 00	131 00	600	850
30	.....	.....	.....	.....	.....	.....	.....	61 00	83 00	105 00	127 00	149 00	171 00	500	735

EMERY CYLINDERS AND CUP WHEELS.

Thickness of Rim	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4 in.
Diameter, 8 inches	\$15 50	.....	.....	.....	.....	.....	.....
Diameter, 9 inches	16 50	22 00	.....	.....	.....	.....	.....
Diameter, 10 inches	17 75	24 25	29 50	.....	.....	.....	.....
Diameter, 12 inches	18 75	26 25	33 00	38 75	44 00	.....	.....
Diameter, 14 inches	22 50	31 00	38 50	45 50	51 50	57 50	61 50
Diameter, 16 inches	26 00	45 75	44 60	53 00	60 25	67 60	73 00
Diameter, 18 inches	28 80	40 25	51 40	61 40	71 00	79 00	86 90
Diameter, 20 inches	30 90	44 00	56 25	67 40	78 50	87 60	97 00
Diameter, 22 inches	35 00	49 75	65 00	79 40	91 50	103 90	115 50
Diameter, 24 inches	37 50	54 25	70 50	86 25	99 50	113 60	126 60
Diameter, 26 inches	39 75	59 80	77 00	93 00	109 25	124 75	139 25

Above list is figured on a basis of Cylinders 7 inches long. Other lengths at proportionate rates.

To obtain price of Cup Wheels, add the price of a regular wheel, whose diameter is the inside diameter of the cylinder and thickness whatever is required.

HUNTINGTON EMERY WHEEL DRESSER.**Plate 1023.**

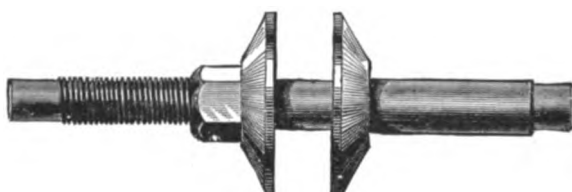
Emery Wheel Dresser (two sets of Cutters), each	\$4 00
Extra Cutters, per set	60

PURE TURKISH EMERY.**NET PRICE LIST.**

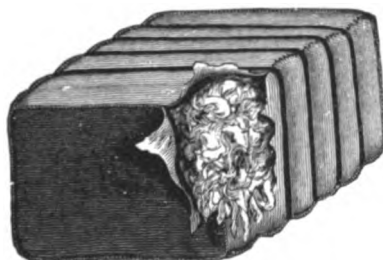
Nos. 4 to 46, in kegs of about 290 pounds, per pound	\$0 04½
Nos. 54 to 180, in kegs of about 290 pounds, per pound	05
Flour, CF, F and FF, in kegs of about 290 pounds, per pound	02½
All grades, in 10 pound tin cans, per pound	10

EMERY CLOTH.

	Per Ream	Per Quire
Nos. 00, 0, ½, 1 and 1½	\$18 00	1 00
No. 2	20 00	1 15
No. 2½	24 00	1 30
No. 3	26 00	1 50

STEEL MANDREL.**HARDENED ENDS.****Plate 1024.**

½ inch, 6 inches long, each	\$2 35
⅝ inch, 7 inches long, each	2 50
¾ inch, 7 inches long, each	3 00

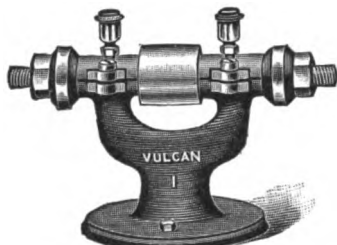
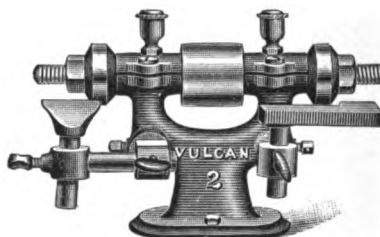
**Plate 1025.****COTTON WASTE.**

No. 1, white	\$.....
No. 2, white . . . . .	.....
No. 1, colored . . . . .	.....
No. 2, colored

OAKUM.**FOR CALKING IRON PIPE AND FITTINGS.**

50-pound Bale, price per pound	\$.....
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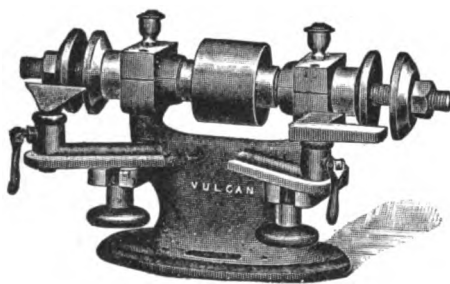
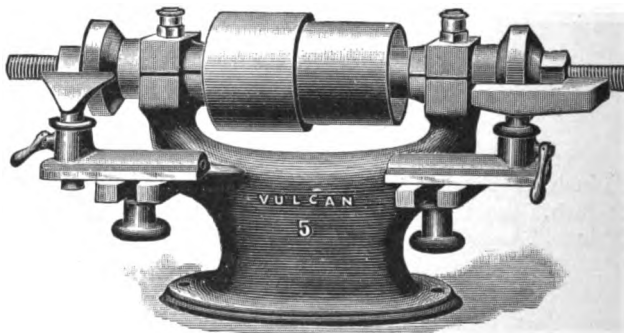
FRICTION PAPER, FOR PULLEYS, PER BUNDLE, \$8.00.

VULCAN GRINDING MACHINERY.**No. 1 GRINDER.****Plate 1026.****No. 2 GRINDER.****Plate 1027.**

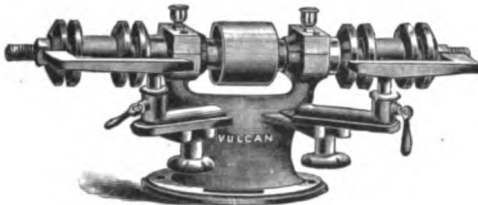
Distance between Collars	1 inch
Distance, Base to Spindle	5 inch
Diameter Spindle (for Wheel)	$\frac{5}{8}$ inch
Length of Mandrel	11 inch
Distance between Wheels	7 inch
Length of Bearings	2 inch
Size of Pulley	2 x $1\frac{3}{4}$ inch
Diameter of Base	6 inch

Size Wheels will take in, 9x1 inches.

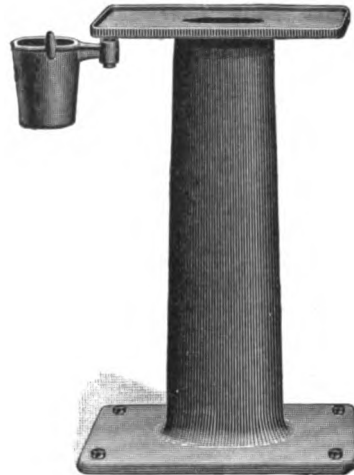
No. 1, without Wheels	\$6 00
No. 2, without Wheels	9 00

Nos. 3 AND 4 GRINDERS.**Plate 1028.****No. 5 GRINDER.****Plate 1029.**

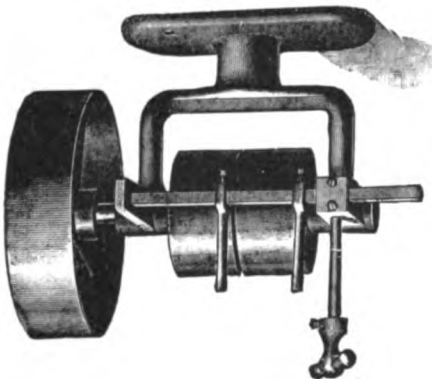
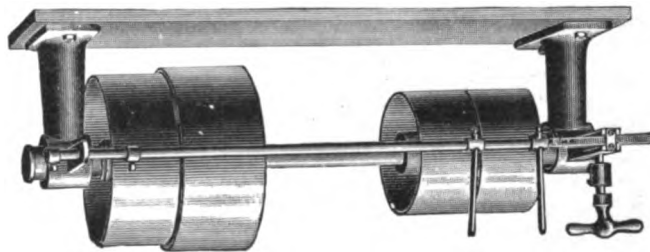
	No. 3 Grinder.	No. 4 Grinder.	No. 5 Grinder.
Length of Mandrel	17 $\frac{1}{2}$ inch	22 inch	32 inch
Length of Bearings	3 $\frac{1}{2}$ inch	4 inch	5 inch
Distance between Wheels	11 $\frac{3}{4}$ inch	14 $\frac{1}{2}$ inch	22 inch
Diameter of Collars	3 $\frac{3}{8}$ inch	3 $\frac{3}{4}$ inch	5 inch
Height, Base to center of Mandrel	7 inch	8 $\frac{1}{2}$ inch	12 inch
Will carry Wheels	10 x $1\frac{1}{4}$ x $\frac{7}{8}$ inch	14 x 2 x 1 inch	20 x 3 x $1\frac{1}{4}$ inch
Size of Pulley	3 x $2\frac{3}{4}$ inch	4 x $3\frac{3}{4}$ inch	.....
Cone Pulley . . . . .	.....	.....	6 & 5 x $4\frac{1}{2}$ inch
With Rests, without Wheels	\$12 00	\$18 00	\$35 00

VULCAN GRINDING MACHINERY.**FOR FOUR WHEELS.****Plate 1030.**

	No. 6. Inches.	No. 7. Inches
Length of Steel Arbor	24	30
Size of Spindle between Collars	$7\frac{7}{8}$	1
Size of Bearings	$1\frac{1}{8} \times 3\frac{1}{2}$	$1\frac{1}{8} \times 4$
Size of Pulley on Arbor	$3 \times 2\frac{3}{4}$	$4 \times 3\frac{3}{4}$
Size of Base	7×10	$8\frac{1}{2} \times 12$
Distance from Bench to Spindle	7	$8\frac{1}{2}$
Size Wheels will carry	10×1	$12 \times 1\frac{1}{4}$
Price, without Wheels	\$15 00	\$24 00

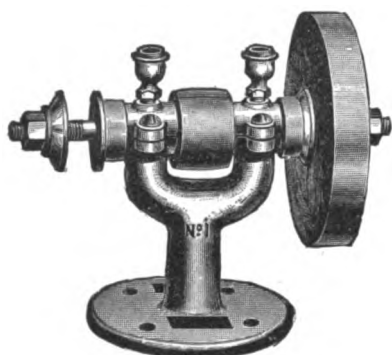
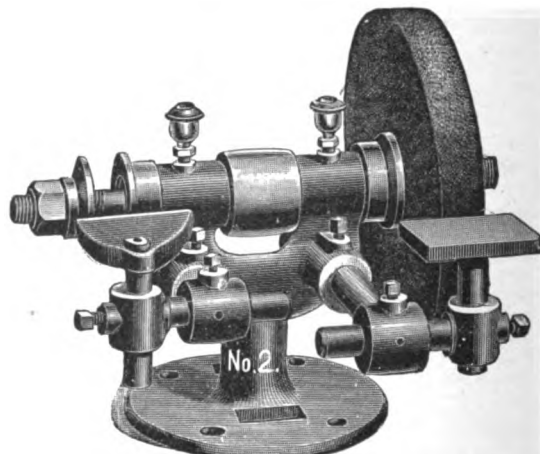
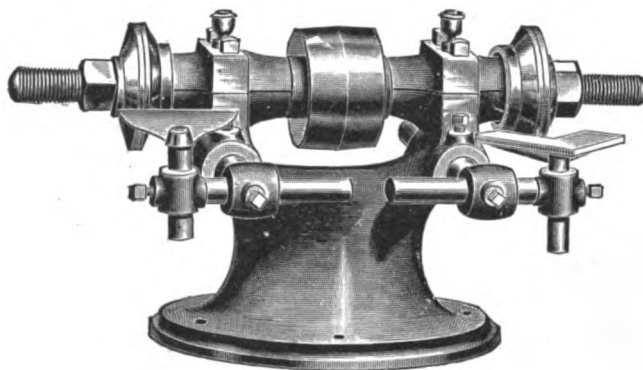
IRON COLUMNS.**Plate 1031.**

	For Nos. 1, 2 and 3 Grinders.	For Nos. 4 and 5 Grinders.
Size of Base	14×16 inch	16×20 inch
Size of Table	12×14 inch	14×18 inch
Height from floor	32 inch	30 inch
Weight	90 lbs.	125 lbs.
Price	\$12 00	\$15 00

COUNTERSHAFTS.**Plate 1032.****COUNTERSHAFT FOR No. 5 GRINDER.****Plate 1033.**

	For Nos. 1 and 2 Grinders.	For Nos. 3 and 4 Grinders.	For No. 5 Grinder.
Tight and Loose Pulleys	$4 \times 1\frac{3}{4}$ inch	$6 \times 3\frac{1}{4}$ inch	$8 \times 4\frac{1}{2}$ inch
Driving Pulley	10×2 inch	$12 \times 3\frac{3}{4}$ inch	.....
Cone Pulley . . . . .	.....	.....	11 and $12 \times 4\frac{1}{2}$ inch
Price	\$8 00	\$12 00	\$16 00

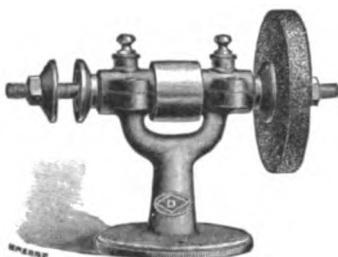
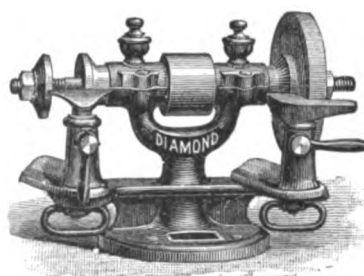
Furnished with improved Belt Shifter.

RUMSEY GRINDING MACHINERY.**RUMSEY No. 2 GRINDING MACHINE.****RUMSEY No. 1 GRINDING MACHINE.****Plate 1034.****Plate 1035.****RUMSEY Nos. 3 AND 4 GRINDING MACHINES.****Plate 1036.**

	No. 1 Grinder	No. 2 Grinder
Size of Mandrel	$9\frac{1}{2} \times \frac{3}{4}$ inch	13×1 inch
Length of Bearings	$1\frac{3}{8}$ inch	2 inch
Distance between Wheels	$5\frac{1}{2}$ inch	7 inch
Diameter of Collars	2 inch	$2\frac{1}{2}$ inch
Height base to center of Mandrel	5 inch	6 inch
Will carry Wheels	$6 \times 1 \times \frac{1}{2}$ inch	$10 \times 1\frac{1}{2} \times \frac{3}{4}$ inch
Size of Pulley	$2 \times 1\frac{3}{8}$ inch	$2\frac{1}{4} \times 1\frac{1}{8}$ inch
Without Wheels	\$5 00	\$10 00
	No. 3 Grinder	No. 4 Grinder
Size of Mandrel	$18\frac{3}{4} \times 1\frac{3}{8}$ inch	$21 \times 1\frac{5}{8}$ inch
Length of Bearings	$3\frac{3}{4}$ inch	$4\frac{1}{4}$ inch
Distance between Wheels	11 inch	$12\frac{1}{4}$ inch
Diameter of Collars	4 inch	$4\frac{1}{2}$ inch
Height of base to center of Mandrel	$7\frac{1}{4}$ inch	$9\frac{1}{2}$ inch
Will carry Wheels	$12 \times 2 \times 1$ inch	$16 \times 2 \times 1\frac{1}{8}$ inch
Size of Pulley	$3\frac{1}{2} \times 2\frac{1}{2}$ inch	$4\frac{1}{2} \times 2\frac{3}{4}$ inch
Without Wheels	\$15 00	\$20 00

DIAMOND GRINDING MACHINERY.**No. 1 GRINDER.****No. 2 GRINDER.**

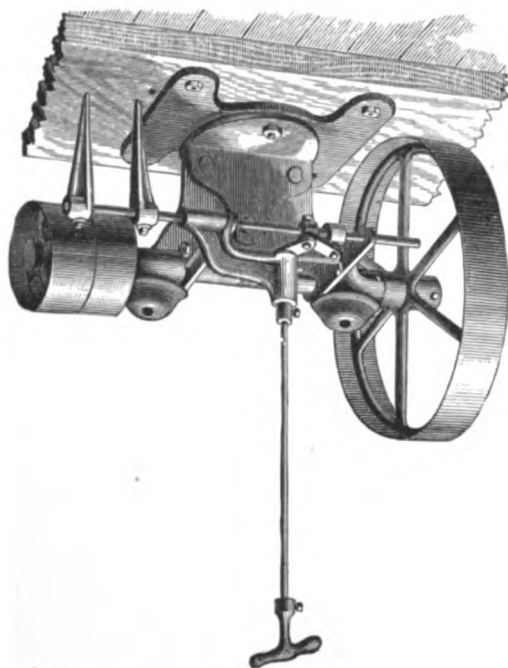
Carry Wheels up to 6 inch Diameter.

**Plate 1037.****Plate 1038.**

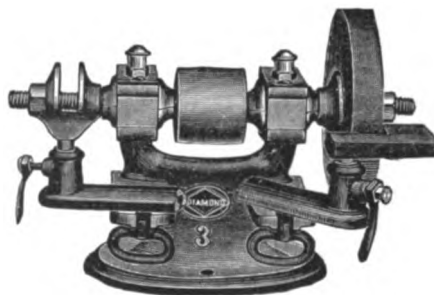
Diameter of Spindle in Bearings	$1\frac{1}{8}$ inch
Diameter of Spindle between Collars	$\frac{1}{2}$ inch
Distance between Collars	$1\frac{1}{4}$ inch
Length of Bearings	$1\frac{7}{8}$ inch
Distance between Wheels	7 inch
Height base to center of Spindle	$5\frac{1}{4}$ inch
Size of Pulley on Spindle	$2 \times 1\frac{1}{2}$ inch
No. 1 Grinder (no Rests), without Wheels	\$6 00
No. 2 Grinder (with Rests), without Wheels	8 50

PATENT COUNTERSHAFT.

For Nos. 1 and 2 Grinders.

**Plate 1039.****No. 3 GRINDER.**

Carries Wheels up to 9 inch Diameter.

**Plate 1040.**

Size of Base	$11 \times 6\frac{1}{2}$ inch
Height from base to center of Spindle	7 inch
Entire length of Spindle	18 inch
Length of Bearings	$3\frac{1}{2}$ inch
Diameter of Spindle in Bearings	$\frac{7}{8}$ inch
Diameter of Spindle between Flanges	$\frac{3}{4}$ inch
Size of Pulley on Spindle	$3 \times 2\frac{3}{4}$ inch
Distance between Wheels	12 inch
Distance between Collars	$1\frac{3}{4}$ inch
Without Wheels	\$16 00

DIMENSIONS OF COUNTERSHAFTS.

	For Nos. 1 and 2 Diamond Grinders	For No. 3 Grinder
Tight and Loose Pulleys	$6 \times 2\frac{1}{4}$ inch	$6 \times 2\frac{3}{4}$ inch
Driving Pulley	$12 \times 2\frac{1}{4}$ inch	12×3 inch
Drop of Hanger	7 inch	$7\frac{1}{2}$ inch
Each	\$12 00	\$15 00

DIAMOND GRINDING MACHINERY.

GRINDING MACHINE No. 5.

NEW PATTERN, ON IRON COLUMN AND TABLE.

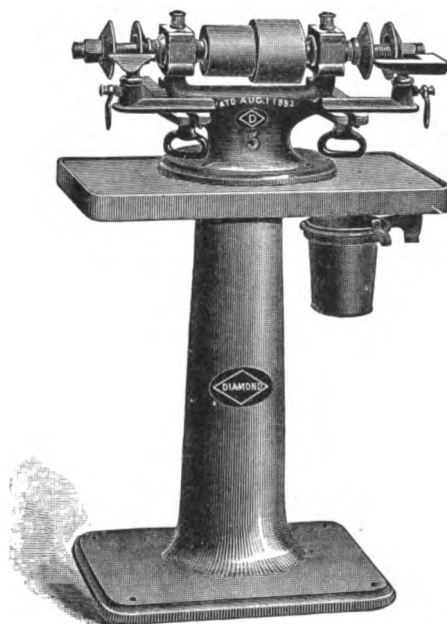


Plate 1041.

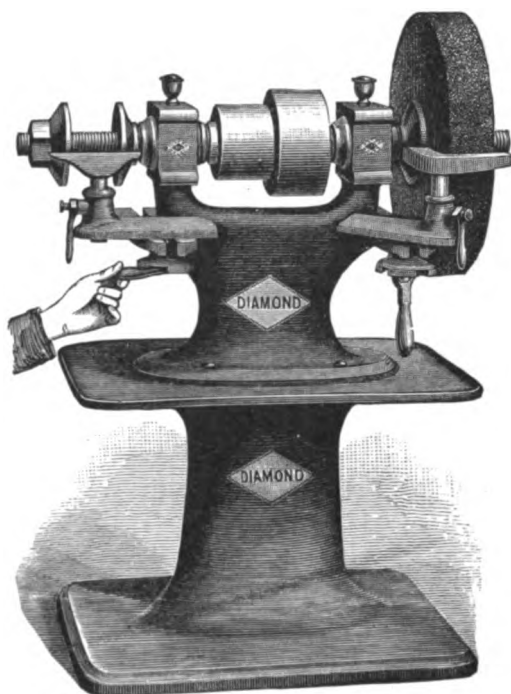
The Machine shown will run two wheels 14 inches in diameter. Has Steel Spindles, Arms for Rest, both front and back; each Rest is provided with Malleable Iron Wrench, attached to its place. The Bearings so enclosed as to prevent the admission of Emery Dust. Brass Oil Cups with Patent Oil Feeders are used. Cast Iron Boxes are used and fitted as to an engine lathe. No. 5 Machine can be used upon Stand with Driving Shaft under, which is arranged to belt from below.

Weight of Machine, with Iron Column.	275 lbs.
Distance between Collars	2¼ inch
Size of Base	13 x 10 inch
Height from Bench to Center of Spindle	9 inch
Distance between Wheels	16 inch
Length of Bearings	4½ inch
Diameter of Spindle in Bearings	1⅞ inch
Diameter of Spindle between Flanges	1 inch
Size of Cone Pulley on Spindle	4½ and 3½ x 3¼ inch

Countershaft used has Tight and Loose Pulleys, 6 inches in diameter, 2¾ inch face. Cone Pulley, 11 and 12 inches diameter, 3 inch face. Countershaft should run 550 revolutions per minute. This will give to the Spindle, on the lowest speed, 1,340 revolutions; on the quickest speed, 1,880 revolutions per minute.

The height of Iron Column from floor to top of Stand is 30 inches. Size of Iron Table, 14 x 25 inches. Weight of Column, 160 lbs.

No. 5 Machine, Head only, without Wheels	\$33 00
Iron Column and Table, with Water Pot	15 00
Countershaft, with Cone Pulley and Patent Belt Shifter	17 00
Machine, Column and Countershaft, complete	65 00

DIAMOND GRINDING MACHINERY.**GRINDING MACHINE Nos. 6 AND 7.****Plate 1042.**

These Machines have strength, neatness of design and durability, and are well adapted for use in any foundry or machine shop. Have Steel Spindles, Iron Tables, Arms for Rests, both front and back (each Rest being provided with Wrench permanently attached to its proper place), and Levers for securing the Rests firmly to the Frame. The Bearings are so enclosed as to prevent the admission of Emery Dust. Brass Oil Cups, with Patent Oil Feeders are used.

	No. 6.	No. 7.
Height from table to center of Spindle	12 inch	15 inch
Height from floor to center of Spindle	35 inch	34 inch
Distance between Wheels	23 inch	26 inch
Length of Bearings	5½ inch	6 inch
Diameter of Spindle in Bearings	1½ inch	1½ inch
Diameter of Spindle between Flanges	1¼ inch	1½ inch
Size of Cone Pulley on Spindle	5 & 6 x 4½ inch	6 & 7 x 4¾ inch
Distance between Flanges	4¼ inch	4¼ inch
Height from floor to top of Iron Table	23 inch	19 inch
Dimensions of Iron Table	26 x 20 inch	26 x 20 inch
Dimensions of Base of Column	24 x 20 inch	26 x 24 inch
Weight, complete, as shown	500 lbs.	700 lbs.
Weight, Column only	225 lbs.	275 lbs.
Will run two Emery Wheels, each	16 inch	20 inch
Head only, without Wheels	\$46 00	\$70 00
Column only	16 50	18 00
Countershaft only	17 50	20 00
Complete, without Wheels	80 00	108 00

DIAMOND GRINDING MACHINERY.

GRINDING MACHINE No. 4.

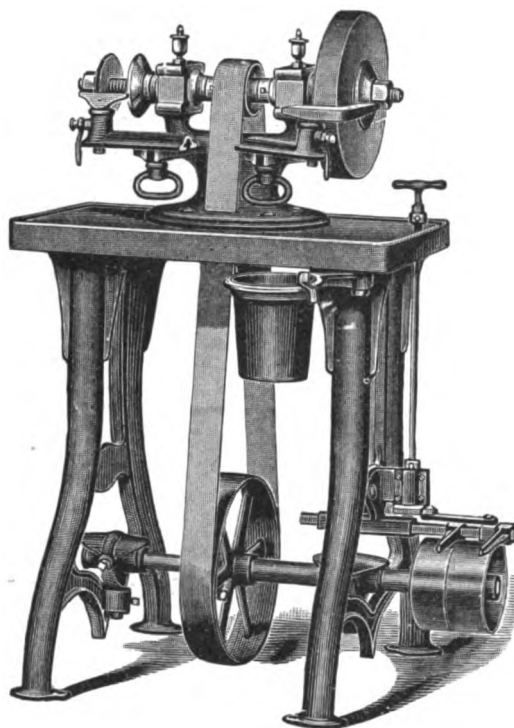
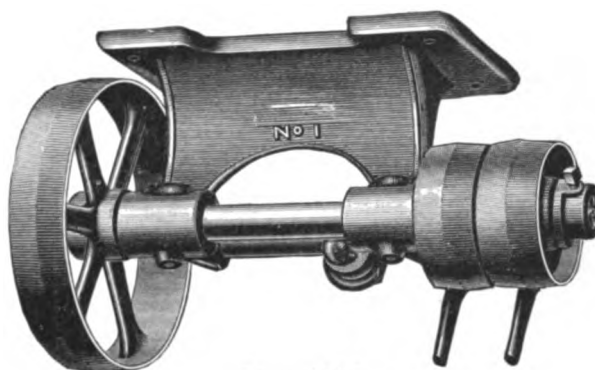
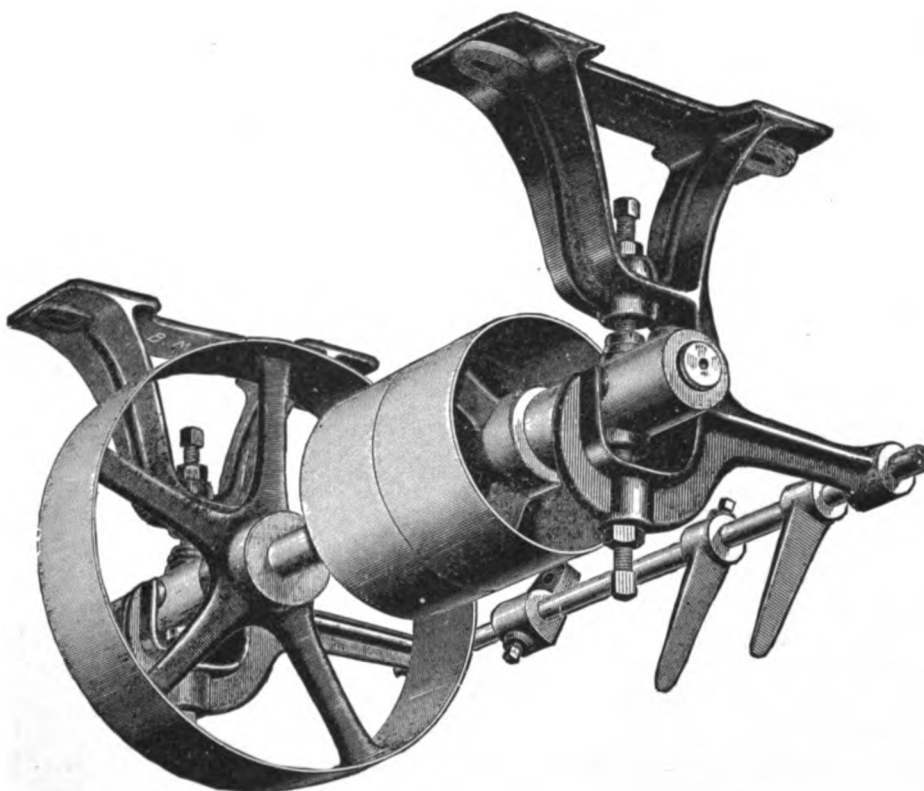


Plate 1043.

This Machine is shown mounted on a neat and substantial frame, with Driving Shaft underneath. The stand has also, permanently attached, a Water Pot, arranged for the purpose of cooling the work when desired. When not in use, it can be swung under the table. Machine has Steel Spindle, two Rests, with Wrench permanently attached to each Rest (the bearings so enclosed as to prevent the admission of Emery Dust), Brass Oil Cups, and is in every respect a first-class machine for tool grinding and light work. Will carry Wheels 12 inches in diameter.

Distance between Collars	2 inch
Height from bench to center of Spindle	9 inch
Distance between Wheels	15 inch
Length of Bearings	4 inch
Diameter of Spindle in Bearings	1 $\frac{1}{8}$ inch
Diameter of Spindle between Flanges	1 inch
Size of Pulley on Spindle	4 x 3 $\frac{1}{2}$ inch
Size of Iron Table	14 x 25 inch
Height of Stand from floor to top of Iron Table	28 inch
Weight (with Frame and Countershaft)	300 lbs.
No. 4 Grinding Machine, Head only (no wheels)	\$28 00
Frame with Water Pot attached	17 00
Driving Shaft and Patent Belt Shifter attached, as shown, or Patent Countershaft for overhead use	15 00
No. 4 Grinding Machine, Stand and Driving Shaft, complete, as shown in cut (without Wheels)	\$60 00

RUMSEY GRINDING MACHINERY.**Nos. 1 AND 2 COUNTERSHAFTS.****Plate 1044.****Nos. 3 AND 4 COUNTERSHAFTS.****Plate 1045.**

	No. 1	No. 2	Nos. 3 and 4
Tight and Loose Pulleys	3 $\frac{3}{4}$ x 1 $\frac{3}{4}$ inch	5 x 2 $\frac{1}{4}$ inch	6 x 2 $\frac{1}{2}$ inch
Driving Pulley	8 x 1 $\frac{3}{4}$ inch	9 $\frac{1}{2}$ x 2 $\frac{1}{4}$ inch	12 x 2 $\frac{1}{2}$ inch
Size of Shaft	1 $\frac{1}{8}$ x 16 inch	1 $\frac{3}{8}$ x 20 inch	1 $\frac{3}{8}$ x 24 inch
Drop of Hangers	5 inch	6 inch	8 inch
Price	\$5 00	7 50	10 00

DIAMOND GRINDING MACHINERY.

GRINDING MACHINE No. 8.

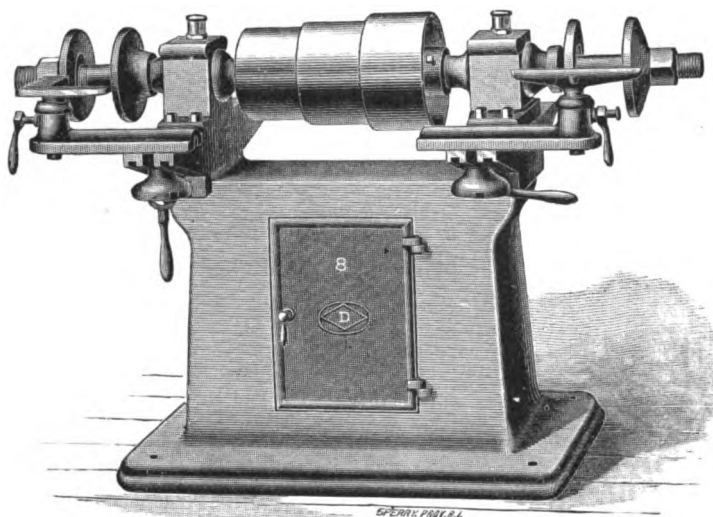


Plate 1046.

This Machine is designed to run two Wheels up to 34 inches in diameter. It is a heavy Machine for large work, combining strength, neatness of design and durability. Has Steel Spindle, Engine Lathe Boxes, Arms for Rests (both front and back), each Rest being provided with Wrench, permanently attached to its proper place, and Levers for securing the Rests firmly to the Frame. The Bearings are so enclosed as to prevent the admission of Emery Dust. Brass Oil Cups with Patent Oil Feeders are used. A surface attachment to use on this Machine is provided when desired.

Distance between Wheels	40 inch
Length of Bearings	8½ inch
Diameter of Spindle in Bearings	2½ inch
Diameter of Spindle between Flanges, as ordered	1¾ or 2 inch
Height from floor to center of Spindle	32 inch
Diameter of Flanges	8 inch
Size of Cone on Spindles	8, 10 & 12 x 5¼ inch
Size of Base	26 x 38 inch
Size of Tight and Loose Pulleys on Countershaft	10 x 5¼ inch
Size of Cone Pulleys on Countershaft	14, 16 & 18 x 5¼ inch
Weight of No. 8 Machine, with Countershaft	1,200 lbs.
Speed of Countershaft	350 revolutions per minute
No. 8 Machine, including Countershaft, without Wheels	\$187 50
Surface Attachment, extra, if wanted	75 00

DIAMOND POLISHING OR BUFFING LATHES.

No. 0 POLISHING OR BUFFING LATHE.



Plate 1047.

Price, with Spindle and Double Pulley, as
shown \$10 00
Price, with Spindle and Single Pulley 8 00

No. 1 POLISHING OR BUFFING LATHE.

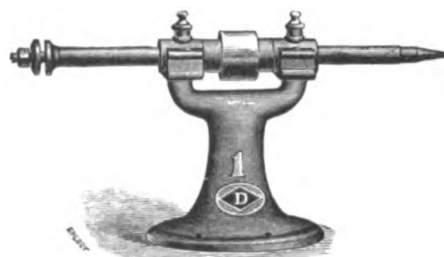


Plate 1048.

Price, with Single Pulley \$10 00
Price, with Tight and Loose Pulley 12 00

The Nos. 0 and 1 Polishing or Buffing Lathes stand 8 inches high, have Cast Iron Boxes 2 inches long, with Caps planed to fit frame, Steel Set Screws for taking up the wear, size of base is 5x8 inches. Dimensions of each Machine are given below, made with Tight and Loose or Single Pulley.

No. 0 POLISHING LATHE.

Size of Base	7 x 5 inch
Height from Base to center of Spindle.	7½ inch
Diameter of Spindle in boxes	¾ inch
Diameter of Spindle between Flanges	1½ inch
Length of Spindles	14 inch
Length of Bearings	2 inch
Size of Pulley	2 x 1½ inch
Weight	12 lbs.

No. 1 POLISHING LATHE.

Size of Base	7 x 5 inch
Height from Base to center of Spindle.	7½ inch
Diameter of Spindle in boxes	7/8 inch
Diameter of Spindle between Flanges	¾ inch
Length of Spindle	17 inch
Length of Bearings	2 inch
Size of Pulley	2½ x 1½ inch
Weight	15 lbs.

No. 1½ POLISHING OR BUFFING LATHE.

SHOWN WITH D SPINDLE.

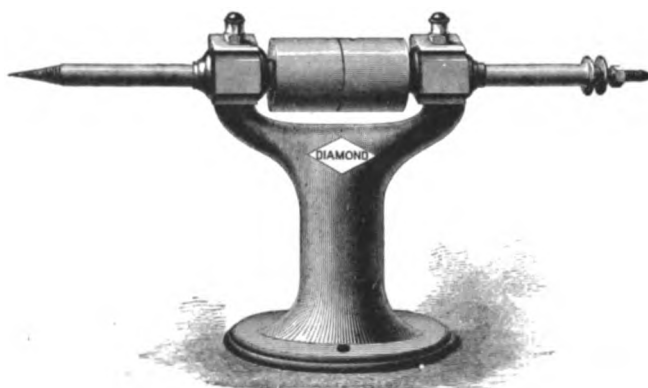


Plate 1049.

No. 1½ Head, with A Spindle and Single Pulley	\$17 50
No. 1½ Head, with D Spindle shown, Tight and Loose Pulley	20 00
No. 1½ Head, with G Spindle and Cone Pulley	22 50

The No. 1½ Polishing or Buffing Head shown stands 12 inches from Base to center of Spindle, has Cast Iron Boxes 4 inches long, with Patent Oil Cups.

STEEL SPINDLES USED IN DIAMOND POLISHING OR BUFFING HEADS.

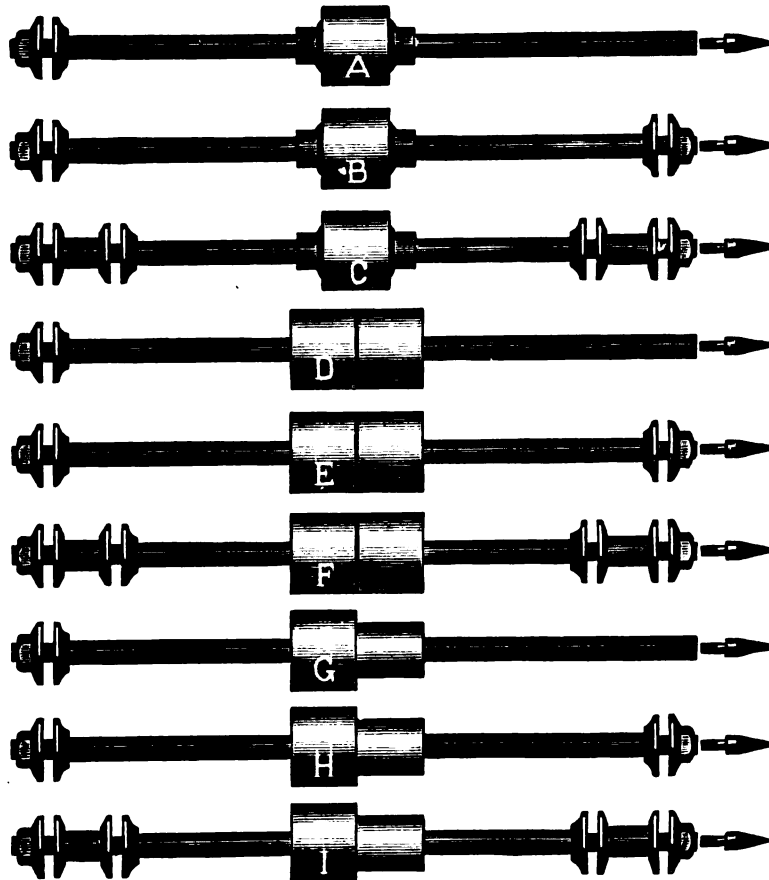
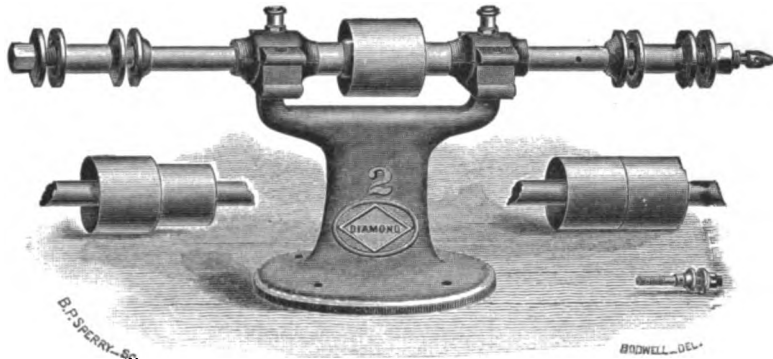


Plate 1050.

Prices with No. 2 Head including one Taper Attachment.

A . . \$20 00 Single Pulley.	D . . \$22 50 Tight and Loose Pulley.	G . . \$25 00 Cone Pulley.
B . . 22 50 Single Pulley.	E . . 25 00 Tight and Loose Pulley.	H . . 27 50 Cone Pulley.
C . . 25 00 Single Pulley.	F . . 27 50 Tight and Loose Pulley.	I . . 30 00 Cone Pulley.

The Spindles shown are made of steel, with all Collars turned perfectly true, square thread cut, nuts milled and squared up. They are made 36 inches long, diameter between Flanges is one inch, and in boxes $1\frac{1}{4}$ inch; diameters of Single, Tight and Loose Pulleys are 4 inches; of Cone Pulleys 4 and 5 inches; they will run belts 4 inches wide; the end of the Spindle, where the Buffing Wheels are used, is drilled and tapped to receive a taper screw which goes with all the Buffing Machines.

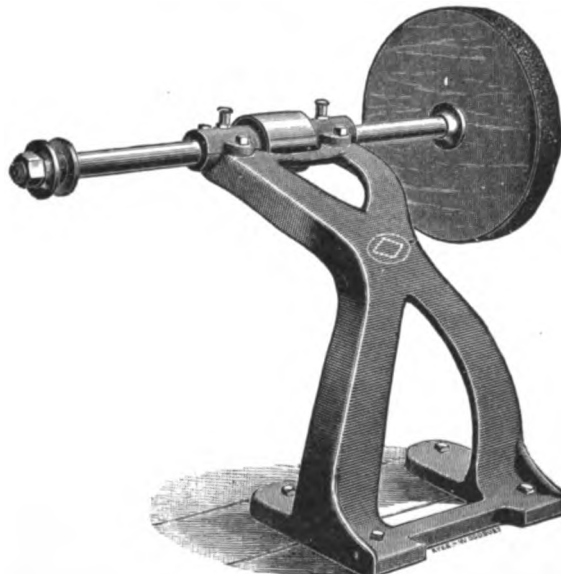
DIAMOND POLISHING OR BUFFING LATHES.**No. 2—SHOWN WITH SPINDLE "C."****Plate 1051.**

The Machine shown can be furnished with Single, Tight and Loose, or Cone Pulley; has hardened steel Cap Screws, and Patent Oil Cups are furnished. A taper attachment is provided, which screws into the end of the Spindle; a small Arbor is also made to fit where the taper screw is used. Prices given for No. 2 Polishing Heads and Spindles do not include the small Arbor, which latter is \$2.50 extra. This is the most complete Machine for the purpose on the market.

With Spindle shown and Single Pulley	\$25 00
With Spindle shown, Tight and Loose Pulley	27 00
With Spindle shown, Cone Pulley	30 00

No. 2 Polishing Heads with other styles of Spindles.

Size of Base	12 x 9 inch
Height from Base to center of Spindle	12 inch
Diameter of Spindle in Boxes	1 1/4 inch
Diameter of Spindle between Flanges	1 inch
Length of Spindle	36 inch
Size of Single Pulley	4 x 4 inch
Size of Cone Pulley	3 1/2 & 4 1/2 x 3 1/2 inch
Length of Cast Iron Bearings	4 1/2 inch
Weight	75 lbs.

PROJECTING POLISHING LATHE.**Plate 1052.**

This Machine bows over toward the workman, throwing the Wheels away from the Bench. It stands 20 inches high, projects 20 inches; has a Spindle 30 inches long, 1 1/4 inches diameter between Flanges. Single pulley, 4 x 4 inches; weight, 100 lbs. These are largely used for polishing tubes, cylinders, hollow-ware, etc.

Without Wheels	\$25 00
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DIAMOND GRINDING MACHINERY.

GRINDING MACHINE No. 9.

SHOWN WITH COUNTERSHAFT AND SURFACE GRINDING ATTACHMENT.

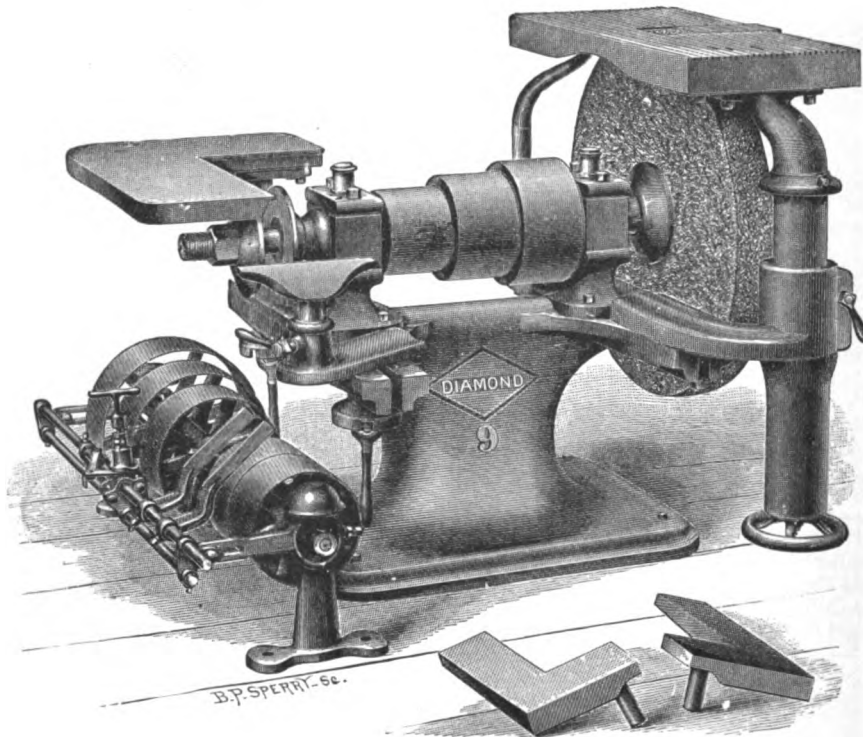


Plate 1053.

This Machine is designed to run two wheels up to 42 inches in diameter. It is a very heavy Machine for large work, and has Engine Lathe Boxes, Patent Emery Dust-excluding Device, Brass Oil Cups, Patent Oil Feeders, and all our patent improvements. It is shown with Surface Grinding Attachment, designed to fasten to the Arms from the back of Machine. It can be raised and lowered at the will of the operator, and when not in use turned away from the wheel. It has right and left hand rests, also an extra large elbow table rest, the same extending past the center, thus enabling the operator to use the side of the wheel as well as the face. The Countershaft has Patent Belt Shifter.

Countershaft has Cone Pulley, 16, 14 and 12 inches in diameter, $6\frac{1}{4}$ inch face. Tight and Loose Pulley, 10 inch diameter, $6\frac{1}{4}$ inch face. Drop of Hangers, 12 inches. Length of Shaft, 50 inches; diameter, $1\frac{3}{4}$ inches. Boxes, $1\frac{3}{8} \times 5$ inches.

Countershaft should run 400 revolutions per minute; this gives to the slowest speed, 400 revolutions; to the quickest speed, 900 revolutions per minute.

Weight of No. 9 Machine	2,400	lbs.
Distance between Wheels	39	inch
Length of Bearings	10	inch
Diameter of Spindle in Bearings	$2\frac{3}{8}$	inch
Diameter of Spindle between Flanges	$2\frac{1}{2}$	inch
Height from floor to center of Spindle	30	inch
Size of Cone Pulley on Spindle	8, 10 and 12 x	$6\frac{1}{4}$ inch
Machine, including Countershaft, without Wheels	\$267	50
Surface Attachment, extra if wanted	100	00
Special Elbow Table Rest	25	00

NEW CYCLONE EMERY GRINDING MACHINE.

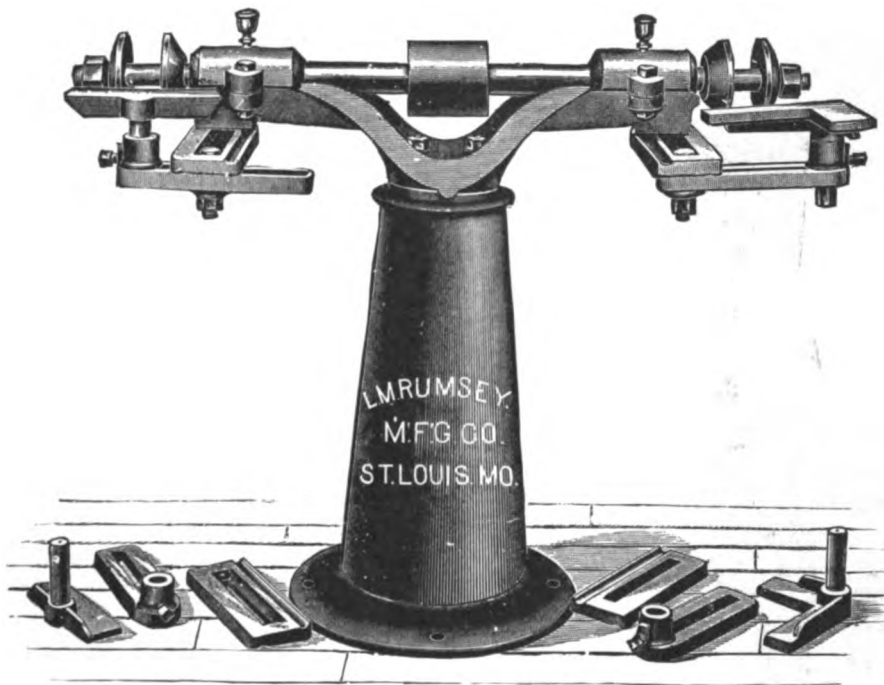


Plate 1054.

There has long been a demand among manufacturers, foundries, machine shops and plow repairers for an Emery Grinding Machine so constructed that large castings and all parts of the various plow shapes can readily be brought to the Emery Wheel. We illustrate a new Machine, which we introduce to the trade, intended to meet all the wants of agricultural manufacturers and plow repairers, and suitable for general grinding. In places where power is used, it will be of the greatest service. It is not expensive as compared with those usually offered. It is the most convenient Grinding Machine ever offered to the trade and is indispensable to any shop where grinding is done. Machines will be furnished with or without Adjustable Rests and Countershafts.

Size of Steel Mandrel	1 3/4 x 42 inch
Diameter Mandrel between Collars	1 1/4 inch
Length Bearings Babbitted	8 inch
Distance between Wheels	32 inch
Size Pulley on Mandrel	4 x 4 1/2 inch
Height floor to center of Mandrel	33 inch
Collars open	3 inch
Weight, complete	200 lbs.
With Rests, without Wheels	\$35 00
Without Rests, without Wheels	32 00
Countershaft only, extra	24 00

THE DIAMOND BENCH TOOL GRINDER.

FIG. 1.

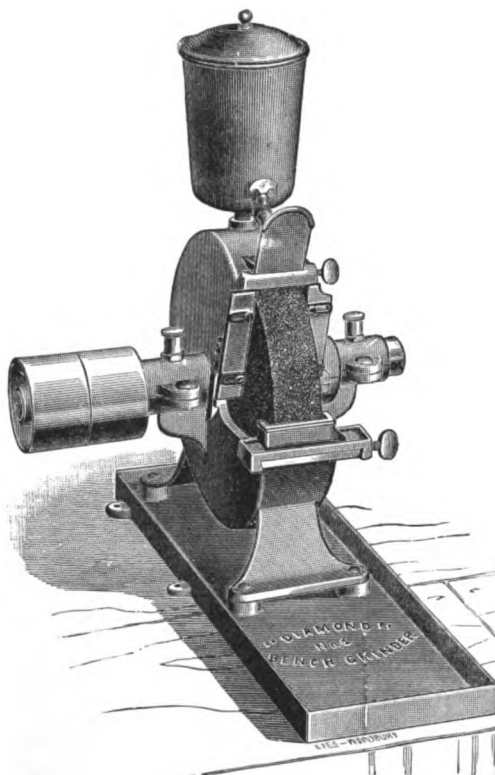


Plate 1055.

FIG. 2—SHOWING BEVEL GRINDING ATTACHMENT, WITH TRAVERSE TABLE AND MOVEMENT ACROSS THE EMERY WHEEL.

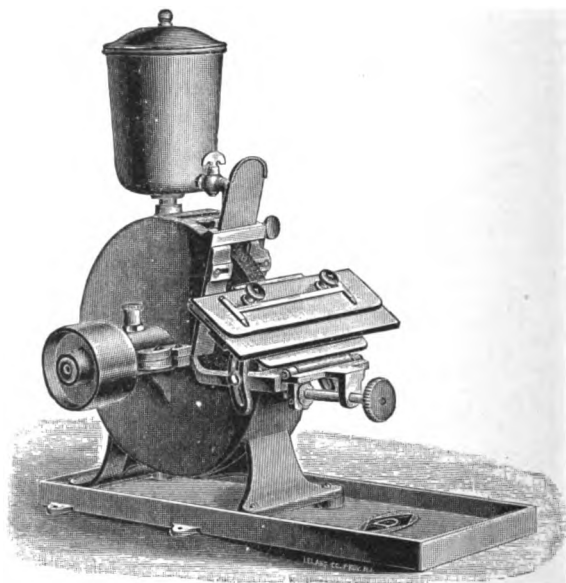


Plate 1056.

Will grind straight and true any length up to 12 inches (or more if required) by hand movements.

The work is moved to the wheel by a screw shown in front of the machine; any angle can be obtained that is desired; the traverse across the face of the emery wheel is by hand movements, the upper table upon which the work is held having two V slides with corresponding grooves to receive the same.

The Diamond Bench Tool Grinder is designed to sharpen machinists' tools of all kinds, running a Corundum Wheel in water, the grade of Wheel varying to suit the kind of work to be done. The particles of Corundum composing the Wheel are hard and sharp, and will cut many times faster than the ordinary grindstone. This Machine can be set up anywhere, taking up bench room of only 22 x 12 inches.

Set the Grinder on bench or stand, slightly pitched to the front, the near edge of pan projecting over the bench. The water runs to the front (where a hole is drilled) and into a bucket or pail, which can be swung from a hook provided underneath the pan. A waste pipe can be attached to run water off, if desired.

Speed of Wheel, 700 to 900 revolutions per minute.

With 10 x 1 inch Wheel, Single or Double Pulleys	\$25 00
With 10 x 2 inch Wheel, Single or Double Pulleys	30 00
Countershaft, extra	12 00
Adjustable Angle Rest, with Traverse Table, as shown in Fig. 2, extra	15 00

REVOLVING FULCRUM CISTERN PUMP.

WITH BRACKETS AND BRASS VALVE SEATS.

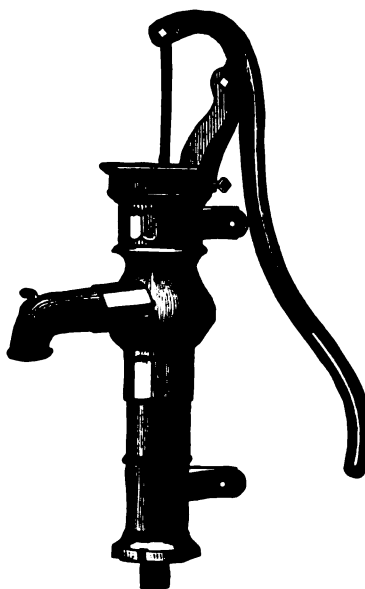


Plate 1057.

The above cut fully illustrates our Bracket Cistern Pump. The particular use will be readily seen, as it is specially adapted to places where a pump with a flanged base could not be used. It can be secured to the wall or a post, as found most convenient, and occupies the least possible space. To prevent freezing, the lever is raised to its full height, which trips the valves and lets the water all out of the pump. This simple act will render all our pumps of this style anti-freezing.

	Diameter Cylinder, Inches	Fitted for Pipe, Inches	Capacity per Stroke, Gallons		Iron, Price	Brass Cylinder, Price
No. 0	2	1	$\frac{1}{16}$	.....	\$3 50	.....
No. 1	$2\frac{1}{4}$	1	$\frac{1}{12}$	.....	4 00	\$ 6 00
No. 2	$2\frac{3}{8}$	$1\frac{1}{4}$	$\frac{1}{11}$	.....	4 50	7 00
No. 3	$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{10}$	.....	5 00	8 00
No. 4	3	$1\frac{1}{2}$	$\frac{1}{8}$	.....	5 50	10 00
No. 5	$3\frac{1}{4}$	2	$\frac{1}{6}$	.....	6 50	14 00
No. 6	$3\frac{1}{2}$	2	$\frac{1}{4}$	.....	8 00	.....

IRON CISTERN PUMP.

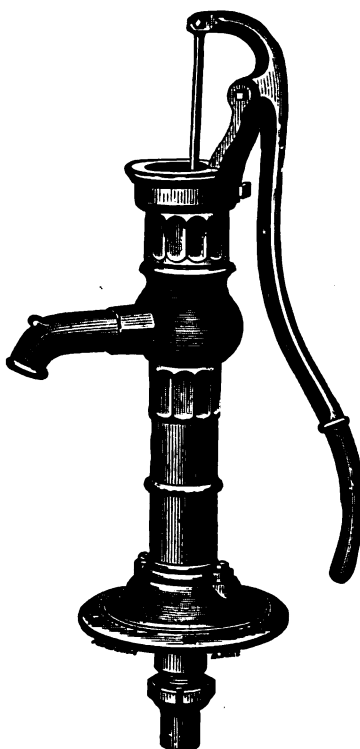
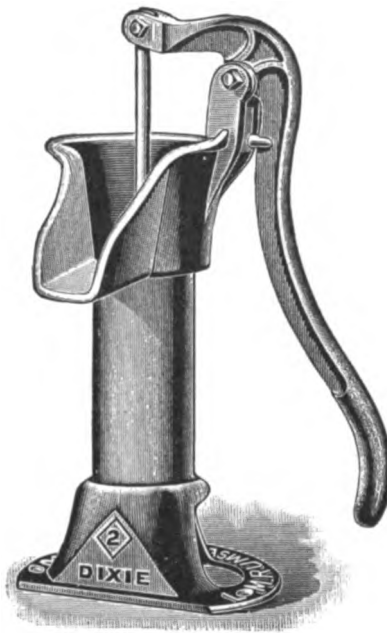


Plate 1058.

Plate 1058 represents our entirely new style Iron Cistern Pump, with Brass Valve Seat and Brass Tubes projecting, for attaching lead, gas and other pipe, as may be ordered. The Fulcrum and Lever revolve, and can be adjusted to any position by merely turning the Set Screw under the Lever. We make eight sizes, as follows:

PLATE 1058.

No.	Diameter Cylinder Inches	Fitted for Pipe Inches	Capacity per Stroke Gallons		Iron Price	Brass Cylinder Price
0	2	1	$1\frac{1}{5}$	.....	\$ 3 50	.....
1	$2\frac{1}{4}$	1	$1\frac{1}{2}$	.....	4 00	\$ 6 00
2	$2\frac{3}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$	.....	4 50	7 00
3	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{6}$	.....	5 00	8 00
4	3	$1\frac{1}{2}$	$\frac{1}{2}$	.....	5 50	10 00
5	$3\frac{1}{4}$	2	$\frac{1}{5}$	.....	6 50	14 00
6	$3\frac{1}{2}$	2	$\frac{1}{4}$	.....	8 00	.....
7	4	$2\frac{1}{2}$	$\frac{1}{3}$	.....	12 00	.....

DIXIE PITCHER SPOUT PUMP.**Plate 1059.**

We are pleased to inform our customers that we are prepared to furnish a special No. 2 Pitcher Spout Pump for the Southern and Western trade which we have named Dixie. The Base, Cylinder, Spout and Fulcrum are cast in one piece. The Pump has polished Cylinder, weight, 15 lbs., and is as well made in every particular as our regular Pumps. We are only making the No. 2 and will furnish the same to jobbers in dozen lots. Parties ordering this Pump must specify the Dixie otherwise we will send our regular Pump, which is higher priced.

We have made this Pump to meet the present demand for a lighter and cheaper one than our regular No. 2, and reserve the right to discontinue this price and Pump without further notice. The price is strictly confined to orders of not less than twelve at a time.

Per dozen, net \$12 00

CLOSE-TOP, NEW STYLE PITCHER SPOUT CISTERN PUMP.

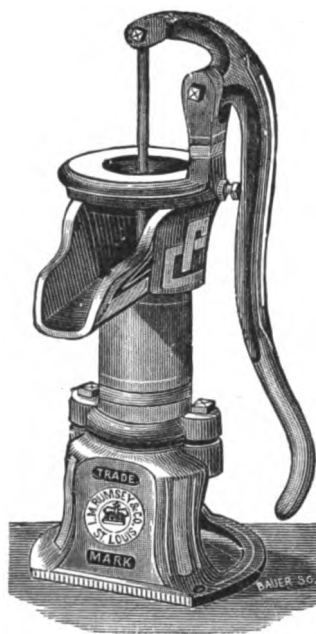


Plate 1060.

Same as regular Pitcher Spout Pump, except in the construction of top, which is closed to prevent dust and other substances from entering, the original design and invention being our own.

Revolving top. To prevent freezing, trip valves by raising lever to its extreme height.

PLATE 1060.

No.	Diameter Cylinder, Inches	Fitted for Pipe, Inches	Capacity Per Stroke Gallons		Iron, Price	Brass-Lined Cylinder, Price
1	2½	1¼	1½	.....	\$4 25	\$ 6 50
2	3	1¼	1	.....	4 75	7 25
3	3½	1¼	¾	.....	5 25	8 00
4	4	1½	¾	.....	5 75	9 00
5	4½	1½	¾	.....	6 25	10 00

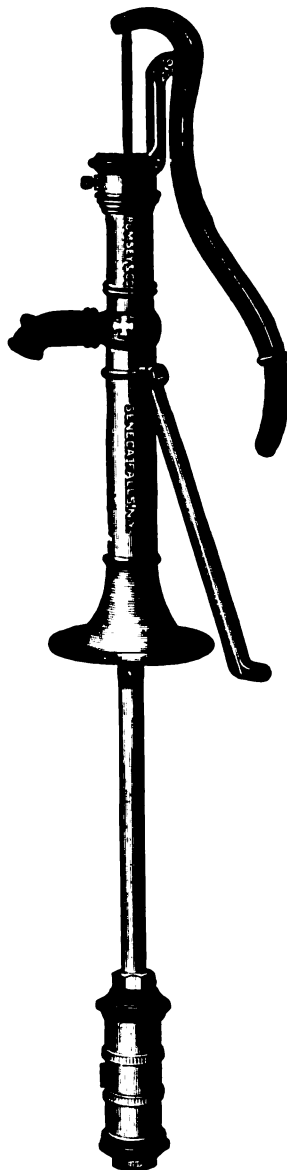


Plate 1061.

NEW STYLE ANTI-FREEZING CISTERN AND WELL PUMP.

Plate 1061 accurately represents our New Style Anti-Freezing Cistern and Well Pump. This pump is made with a wrought iron set length, connecting into the stock just below the spout, and in every respect, both in design and workmanship, it challenges comparison with any pump made.

PLATE 1061.

No.	Diam. Cyl., Inches	Suction, Inches	Price
3	2 $\frac{3}{4}$	1 $\frac{1}{4}$	\$8 25
4	3	1 $\frac{1}{4}$	8 50
5	3 $\frac{1}{4}$	1 $\frac{1}{4}$	9 00

STANDARD ONLY.

No.	Without Cylinder or Set Length.	Price
3		\$4 00
4		4 50
5		5 25

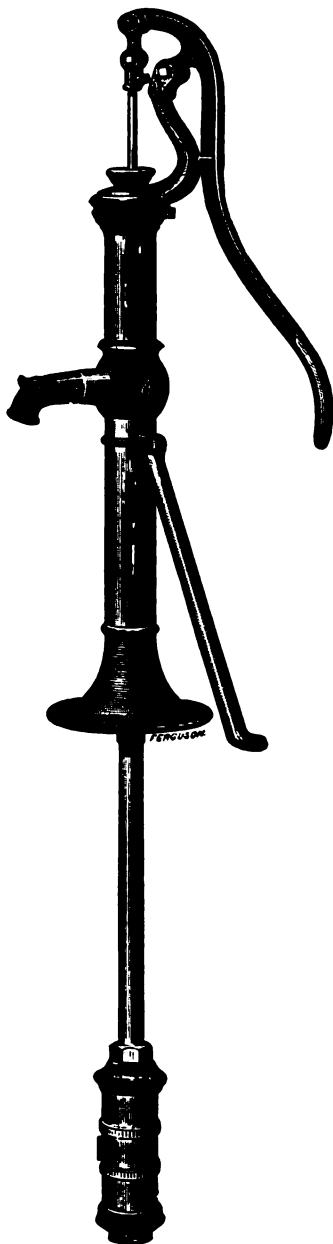
NEW STYLE CLOSE TOP WELL PUMP.**ANTI-FREEZING WROUGHT-IRON CONNECTING PIPE.****Plate 1062.**

Plate 1062 is the same in all respects as Plate 1061, with the exception that it has a close top, which effectually prevents all foreign substances from getting into the pump. Both Plates 1061 and 1062 are entirely new in design; they are made with special reference to the trade, and we place them in the market confident that their excellent points will be appreciated.

	Diam. Cylinder, Inches	Suction, Inches	Height of Stock, Inches	Base to Spout Inches	Price
No. 3	2 $\frac{3}{4}$	1 $\frac{1}{4}$	33 $\frac{1}{4}$	19 $\frac{1}{2}$	\$8 75
No. 4	3	1 $\frac{1}{4}$	35 $\frac{1}{4}$	21	9 25
No. 5	3 $\frac{1}{4}$	1 $\frac{1}{4}$	37 $\frac{1}{4}$	23	9 75

STANDARD ONLY.

Without Cylinder or Set Length.

No. 3	\$4 50
No. 4	5 00
No. 5	5 75

ANTI-FREEZING SET LENGTH PUMPS.**WITH WROUGHT IRON EXTENSION (OR SET LENGTH).****Plate 1063.**

Always say whether tight or open top pump is wanted.

Well Pump, anti-freezing, with wrought iron extension (or set length), revolving fulcrum, and rubber buffer to relieve the concussion of the lever at the termination of its downward stroke. It is always fitted for 1½ inch pipe unless otherwise ordered.

PLATE 1063.

	Open Top	Tight Top
No. 7	\$14 00	\$16 00

Fitted with 3½ inch Cylinder.

LARGE OPEN TOP STOCK PUMP.

FOR WATERING STOCK.

**Plate 1064.**

Plate 1064 is a cut of our Open Top Yard Well Pump. This is thoroughly built in every particular, and of handsome appearance. It is rendered anti-freezing without tripping the valves, they being placed below the reach of frost. The plunger can also be easily withdrawn for repairs. This Pump has our Patent Sand Valve and Brass Valve Seat. It is heavy, strong, and fully meets all the requirements of an excellent Farm Pump for watering stock, or for other purposes where a considerable quantity of water is used. Fitted for wrought-iron pipe, unless cast-iron is ordered.

PLATE 1064.

	Diameter Cylinder, Inches	Capacity per Rev., Gallons	Suction, Inches	Price
No. 8	5	$\frac{1}{3}$	2	\$16 00

ANTI-FREEZING LIFT AND FORCE PUMPS.

WITH WROUGHT-IRON EXTENSION PIPE.

**Plate 1065.**

The annexed cut well represents our new Tube Well Force Pump, designed and constructed specially to supply a necessity long existing in the driven-well trade. There is a universal demand from all quarters for a reliable Pump to fill such a vacancy, at once combining strength, symmetry, utility, and cheapness, and from our numerous testimonials and orders for this particular Pump, we know that it entirely fulfills all these requirements, and stands peerless amongst all others of its class. Like all our Force Well Pumps, it has a Brass Rod, which does not corrode and tear out the packing, so that the bad leakage at the stuffing-box, so common to this class of pumps, is effectually avoided. The stock and air-chamber are made in one piece, with a tube extending downward through the latter, at once preventing the escape of air from the chamber and providing the best possible guide of the piston rod below the brass stuffing-box in the cap. Hose can readily be connected to the spout by means of an attachment provided (gratuitously) for this purpose. It is made anti-freezing in the same manner as all of our extension pumps, the cylinder being placed three feet below the surface of the ground or platform, and having a vent-hole drilled at or near the top of the cylinder, allowing the escape of all water from the stock and connecting pipe after pumping.

These Pumps are arranged for wells not exceeding 30 feet in depth, but by inexpensive auxiliaries are often used where the well is of 50 feet, or greater, depth.

DIRECTIONS.

When used as a Force Pump, the thumb-screw in the air-chamber should be screwed tight. Take out the screw when used as an ordinary Lift Pump.

	Diameter Cylinder, Inches	Suction, Inches	Capacity per Rev'n., Gallons	Price
No. 1	2 $\frac{3}{4}$	1 $\frac{1}{4}$	$\frac{1}{8}$	\$13 00
No. 2	3	1 $\frac{1}{4}$	$\frac{1}{2}$	13 50
No. 3	3 $\frac{1}{4}$	1 $\frac{1}{4}$	$\frac{1}{4}$	14 00
No. 4	3 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{3}$	14 50

For 3 feet hose and discharge pipe add \$3.00 to list price.

ANTI-FREEZING ENGINE WELL FORCE PUMP.

WITH REVOLVING FULCRUM, BRASS PISTON ROD, ETC.

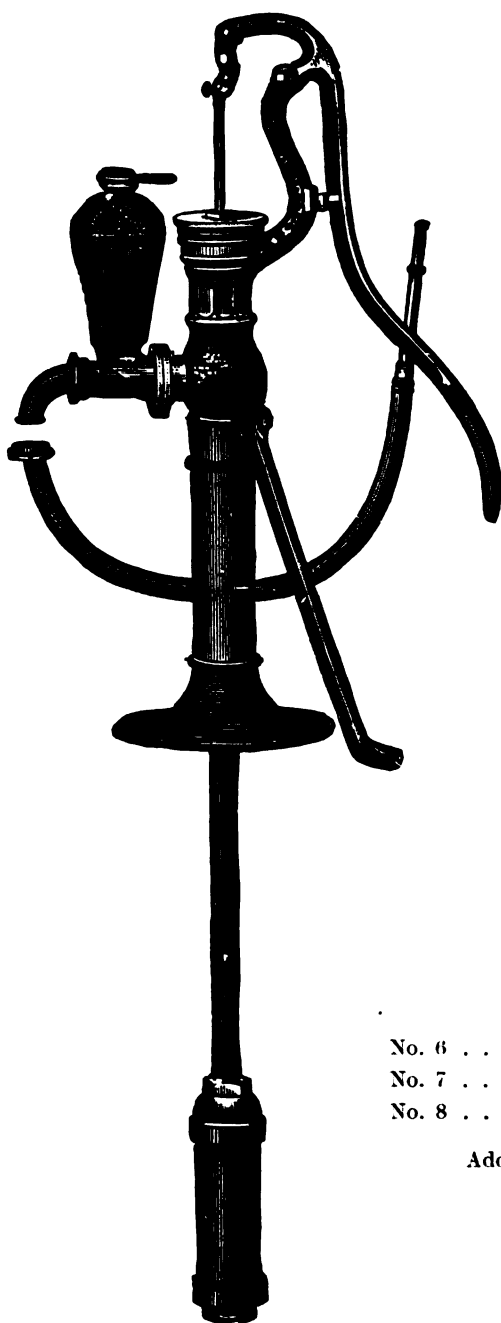


Plate 1066.

Plate 1066 represents our Engine Well Pump. We manufacture three sizes of this style.

It is intended for wells not exceeding 30 feet in depth, but its strength is amply sufficient for service in wells of twice that depth. It is hardly requisite to enumerate or explain the many good qualities, as the cut portrays perfectly the appearance of this pump. It will force water in any desired direction, while as an efficient engine for extinguishing fires, watering lawns, washing windows, carriages, etc., it is without an equal. It is equally serviceable as a lift well pump. Its relative size and varied utility, combined with the cheap price, renders it unrivaled by any pump of the kind in the market.

DIRECTIONS FOR MANAGEMENT.

The nut on top of the air-chamber should be screwed down perfectly tight when used as a force pump. When used as an ordinary lift pump, the nuts must be unscrewed two or three turns, to permit the air to escape from the chamber.

PLATE 1066.

	Diam. Cylinder, Inches	Suction Inches	Capacity per Rev., Gallons	Price
No. 6	3	1 $\frac{1}{4}$	$\frac{1}{2}$	\$13 00
No. 7	3	1 $\frac{1}{4}$	$\frac{1}{2}$	15 00
No. 8	3 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$	17 00

Add \$3.00 to list for 3 feet of hose and discharge pipe.

SPECIAL FORCE PUMP STANDARD.**Plate 1067.**

The accompanying cut well represents our new Tube Well Force Pump, designed and constructed specially to supply a necessity long existing in the drive well trade. There is a universal demand from all quarters for a reliable pump to fill such a vacancy, at once combining strength, symmetry, utility and cheapness, and from our numerous testimonials and orders for this particular Pump, we know that it entirely fulfills all these requirements, and stands peerless amongst all others of its class. Like all our Force Well Pumps, it has a Brass Rod, which does not corrode and tear out the packing, so that the bad leakage at the stuffing-box, so common to this class of Pumps, is effectually avoided. The Stock and Air Chamber are made in one piece, with a Tube extending downward through the latter, at once preventing the escape of air from the Chamber and providing the best possible guide for the Piston Rod below the Brass Stuffing-Box in the Cap. Hose can readily be connected to the Spout by means of an attachment provided (gratuitously) for this purpose.

Standard, for 1¼ inch Pipe	\$10 00
For 3 feet Hose and Discharge Pipe, add to list	3 00

Above prices do not include Cylinder.

When arranged with Cock on Spout, add to list	2 50
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RUMSEY'S PATENT ENGINE WELL PUMP.

STANDARD FOR DEEP WELLS.

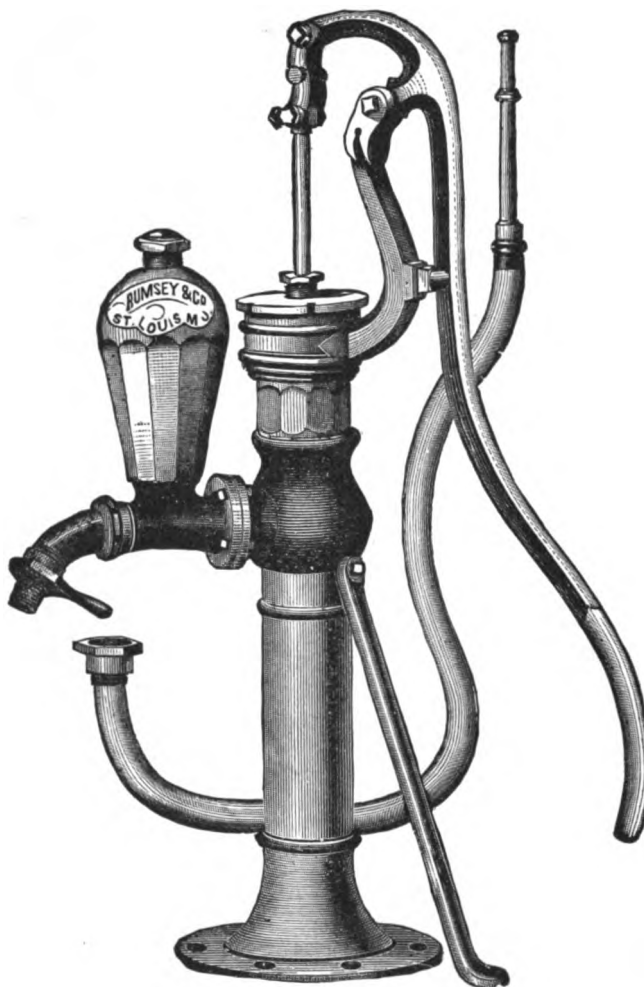


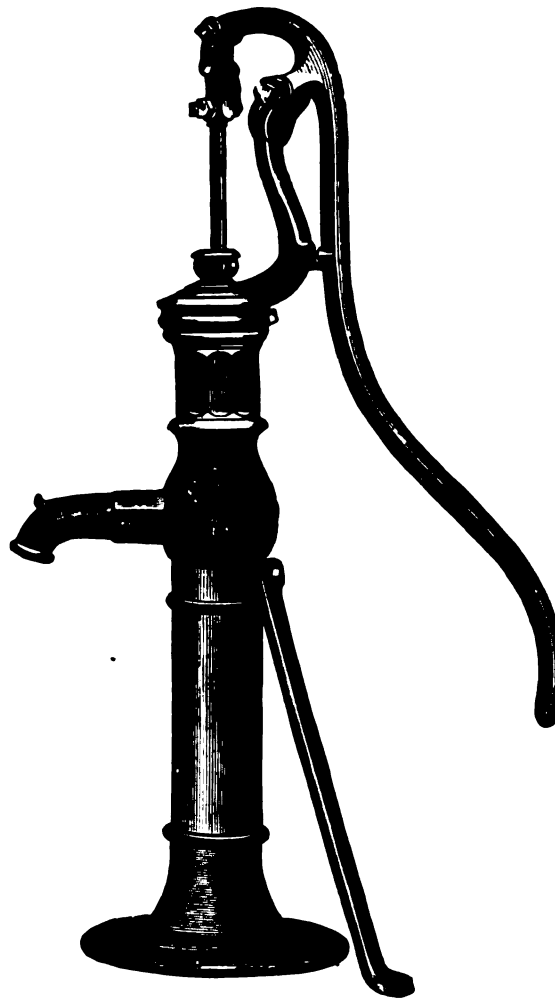
Plate 1068.

No.	Suction Pipe, Inches	Price
6	1¼	\$10 00
7	1½	11 00
8	1½ or 2	13 00

With 3 feet of hose and discharge pipe, add to list \$3.00. Above prices do not include Cylinders.

PATENT TIGHT TOP STANDARD.

FOR WELLS UP TO 100 FEET IN DEPTH.

**Plate 1069.**

This Pump is cut for Wrought Iron Pipe in the stock near the spout, and is less liable to burst by freezing; in fact, it is an impossibility for it to be injured through this cause, as no water is contained in the stock. In ordering this Pump, always mention the internal diameter of pipe for which it is to be cut, as we can arrange for any desired size; also state the kind of rods intended to be used, as we make the stubs either to weld to connecting rods, or to screw with rod couplings.

Plate 1069, Standard, complete, as per cut, 1½ inch Pipe \$10 00

Price does not include Cylinder.

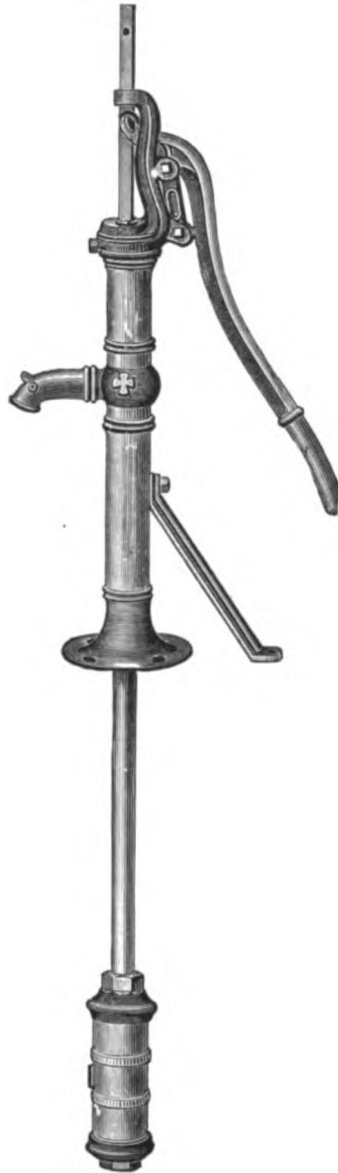
PATENT TIGHT TOP STANDARD.**WITH TWO BRACES.****Plate 1070.**

Plate 1070 is an accurate representation of our Tight Top Standard Artesian Well Pump. This is a very strong and compact Pump, well calculated to sustain, without injury, the hard usage always received by a street Pump. In addition to an unusually large base, are two strong braces, which, bolted firmly to the platform of the well, effectually prevent all possibility of the Pump working loose by the hardest test to which it may be subjected. The bearer or fulcrum is connected to a ring, inside of the stock, by three bolts, and revolves to any desired position. It is also provided with a rubber buffer, which obviates the concussion at the close of each stroke, and absolutely prevents the breakage of the lever by any carelessness. Nothing injurious to the working of the valves can by any possibility get into this Pump. We recommend this Pump as permanent and suitable for any depth of well of less than 200 feet, and guarantee good satisfaction in its use.

Plate 1070, Standard complete, as shown in cut.

Threaded for 1½-inch pipe	\$16 00
Threaded for 2-inch pipe	16 00

These prices do not include cylinder.

MALTESE CROSS WELL PUMP.**WIND MILL TOP, WROUGHT IRON CONNECTING PIPE, ANTI-FREEZING.****Plate 1071.**

This cut represents the same standard as Plate 1073, but with the addition of a Wrought Iron Connecting Pipe and Cylinder. Stroke, 8 inches.

	Suction, Inches	Diam. Cyl., Inches	Price
No. 3	1 $\frac{1}{4}$	2 $\frac{3}{4}$	\$9 00
No. 4	1 $\frac{1}{4}$	3	9 50
No. 5	1 $\frac{1}{4}$	3 $\frac{1}{4}$	10 00

ANTI-FREEZING WIND-MILL FORCE PUMP STANDARD.

WITH PATENT VERTICAL DISTRIBUTING VALVE AND BRASS
ELBOW ATTACHMENT.

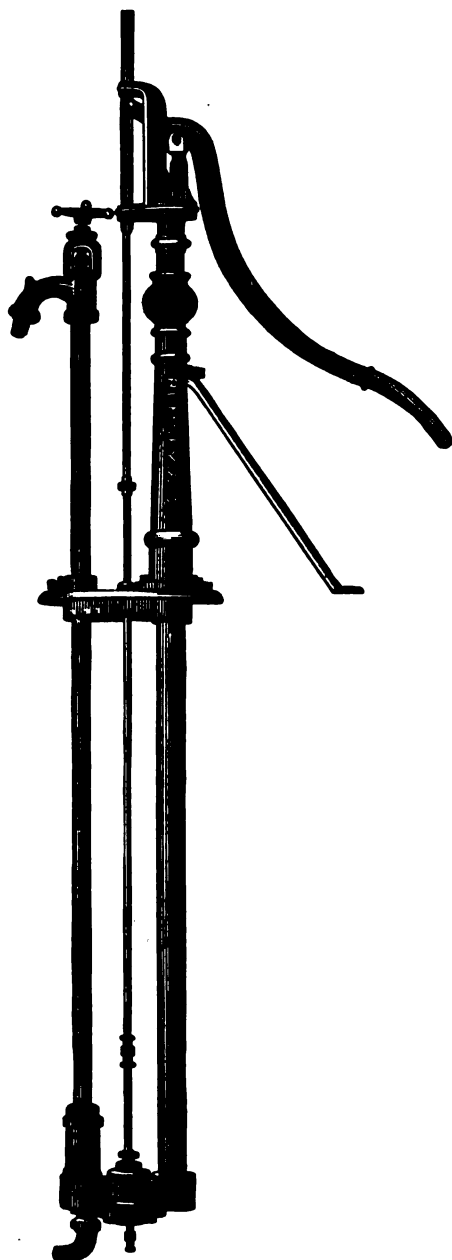


Plate 1072.

Plate 1072 represents our Anti-Freezing Wind-Mill Force Pump with vertical distributing valve, and brass elbow attachment at the bottom outlet. We use $1\frac{1}{4}$ inch iron pipe for the discharge, which is made in one piece, and held in place with a set screw at the platform base, so that by merely unscrewing the coupling below and loosening the set screw at the base, the pipe can be pulled up, and the valve and working parts examined and repaired. We use 2 inch iron pipe for the air chamber, which is done to strengthen the set length and keep the working parts in perfect line with each other. At the bottom outlet we use a brass elbow union attachment, which is more convenient in making the regular pipe connections than any other way. We use a regular brass stuffing-box above the spout, which prevents all leakage when hose is connected. The valve is opened and closed by turning the wheel above the stuffing-box, as shown in cut. The opening through the platform is made larger, and pipe can pass through without taking off the standard. We also use a malleable union coupling for the plunger rod, which can be disconnected much easier than with the ordinary coupling. At the lower working head it is so arranged that by merely unscrewing the cap or attachment on top, a 2 inch or $2\frac{1}{2}$ inch plunger can be drawn through, and so on up through the opening at the platform base.

Always fitted for $\frac{3}{4}$ inch hose coupling at the spout, and for 1 inch iron pipe at brass elbow attachment. The bottom flange is always fitted as below, unless otherwise ordered. When fitted for 2 inch suction pipe, we always furnish a malleable forked rod connection for wood rod, unless otherwise ordered.

No.	Stroke, Inches	Suction, Inches	Height, Base to Upper Guide, Inches	Length, Base to Bottom Flange, Inches	Price
1	6	$1\frac{1}{4}$	46	58	\$18 00
2	10	2	50	58	19 50

SPECIAL MALTESE CROSS WIND-MILL PUMP STANDARD.**Plate 1073.**

Plate 1073 represents our improved Wind-Mill Standard. It is strong, substantial and well braced. It is made, as are all of our Wind-Mill Pumps, so the Piston Rod always works in line with the Plunger. This Standard is made regularly with 6 or 10 inch stroke. We also make same with an adjustable stroke, so that a stroke of 6, 8 or 10 inches can be obtained by a simple adjustment of the bearer. The Pipe screws into the Standard immediately below the Spout.

	Fitted for Pipe, Inches	Height, Inches	Stroke. Inches	Price
No. 3	1 $\frac{1}{4}$	43	6	\$ 7 00
No. 4	1 $\frac{1}{4}$	45	6	7 50
No. 5	1 $\frac{1}{4}$	47 $\frac{1}{2}$	6	8 00
No. 4	2	45	10	9 00
No. 5	2	47 $\frac{1}{2}$	10	9 50
No. 4	2	45	6, 8 or 10. Adjustable	9 50
No. 5	2	47 $\frac{1}{2}$	6, 8 or 10. Adjustable	10 00

The above prices do not include Cylinder.

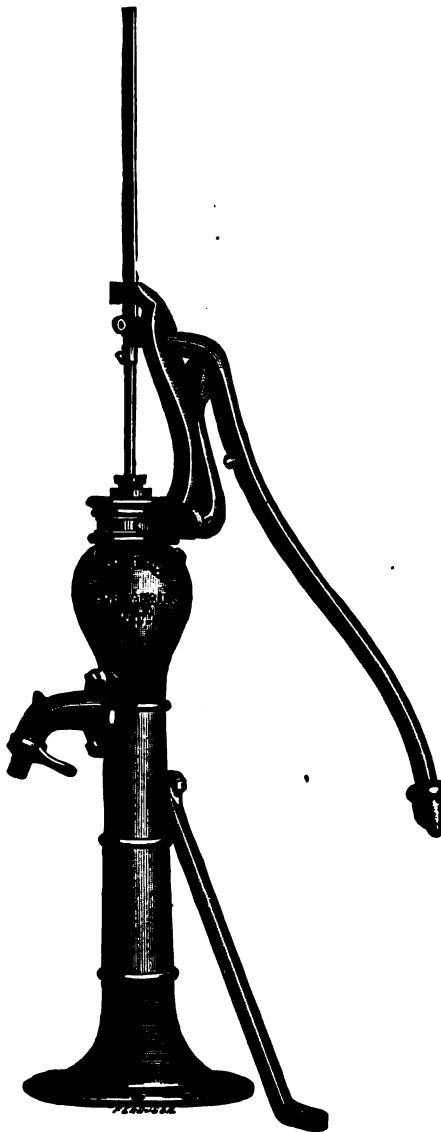
WIND-MILL FORCE PUMP STANDARD.**FOR DEEP WELLS.****Plate 1074.**

Plate 1074 represents our anti-freezing engine Well Force Pump Standard, in an improved form, being especially adapted for use with wind-mills. The air-chamber is combined with the standard instead of being placed on the discharge. This Pump can be used in wells of any depth up to 200 feet. Hose can be easily connected, and the Pump readily converted into a very efficient fire engine, or adapted to any of the many uses for which a first-class Force Pump is usually designed. We tap it to receive the gas pipe just below the spout.

6-inch stroke	\$11 00
10-inch stroke	12 50

Above prices do not include Cylinders.

EAGLE WIND-MILL FORCE PUMP.**WITH COCK, REVOLVING BRAKE AND BRASS PISTON ROD.****Plate 1075.**

Plate 1075 represents our new Force Pump on base, arranged for use with wind engines. It is especially designed for forcing water to elevated tanks, and is also so arranged that the water can be drawn from the tank, through the same pipe, and hose can be attached to the cock and conducted any distance, or in case of necessity it may be used as an efficient fire engine.

	Suction, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons	Iron Price	Brass Cylinder, Price
No. 1	1¼	2½	6	1/8	\$13 50	\$19 00
No. 2	1¼	3	6	1/4	15 50	20 50
No. 3	1¼	4	6	3/8	24 00	37 00

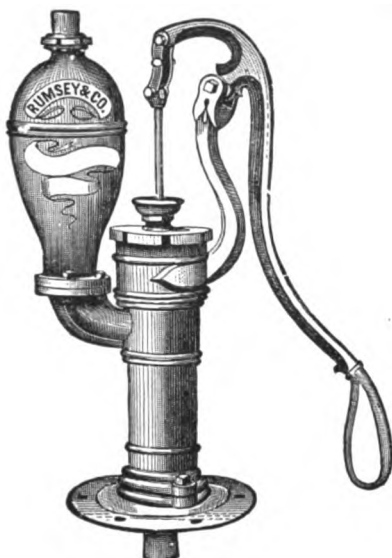


Plate 1076.

FORCE PUMPS.

ON BASE.

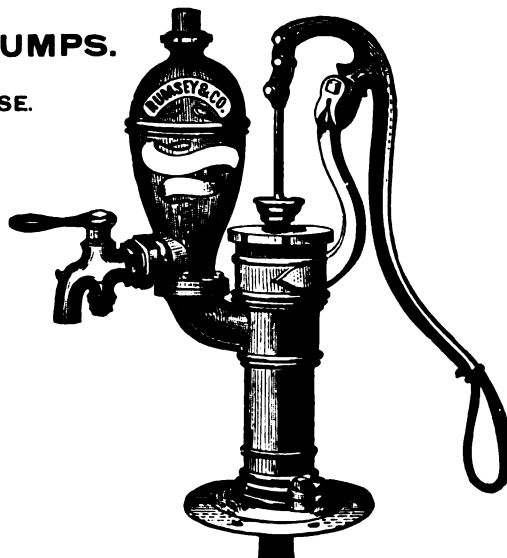


Plate 1077.

		PLATE 1076.			
No.	Size of Pipe	Iron	Brass Cyl.	No.	Size of Pipe
No. 1,	2½ inch Cylinder, suitable for 1¼ inch Pipe, each	\$10 00	\$15 00	No. 1,	2½ inch Cylinder, suitable for 1¼ inch Pipe, each
No. 2,	3 inch Cylinder, suitable for 1¼ or 1½ inch Pipe, each	12 00	16 00	No. 2,	3 inch Cylinder, suitable for 1¼ or 1½ inch Pipe, each
No. 3,	4 inch Cylinder, suitable for 1½ or 2 inch Pipe, each	21 00	30 00	No. 3,	4 inch Cylinder, suitable for 1½ or 2 inch Pipe, each

		PLATE 1077.

		PLATE 1077.			
No.	Size of Pipe	Iron	Brass Cyl.	No.	Size of Pipe
No. 1,	2½ inch Cylinder, suitable for 1¼ inch Pipe, each	\$12 50	\$17 50	No. 1,	2½ inch Cylinder, suitable for 1¼ inch Pipe, each
No. 2,	3 inch Cylinder, suitable for 1¼ or 1½ inch Pipe, each	14 50	18 50	No. 2,	3 inch Cylinder, suitable for 1¼ or 1½ inch Pipe, each
No. 3,	4 inch Cylinder, suitable for 1½ or 2 inch Pipe, each	23 50	34 50	No. 3,	4 inch Cylinder, suitable for 1½ or 2 inch Pipe, each

Extra, for 3 feet of Hose and Discharge Pipe, \$3.00.

ON PLANK.

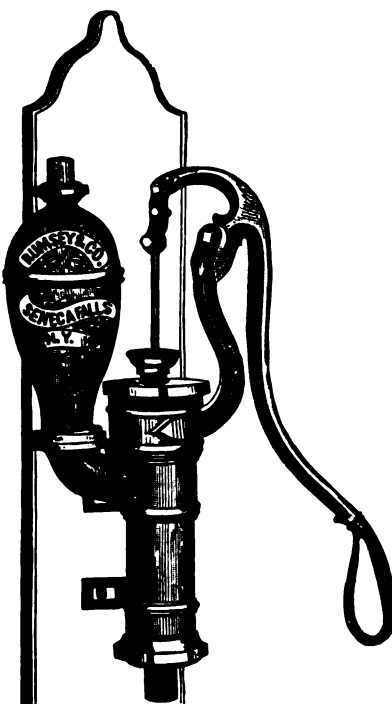


Plate 1078.

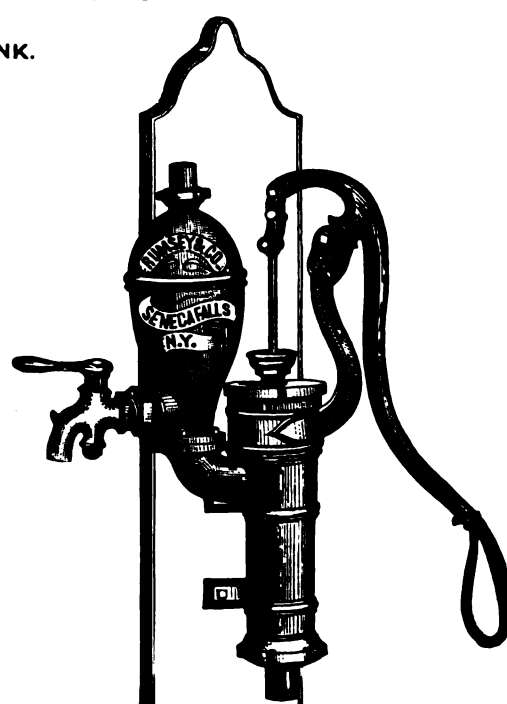
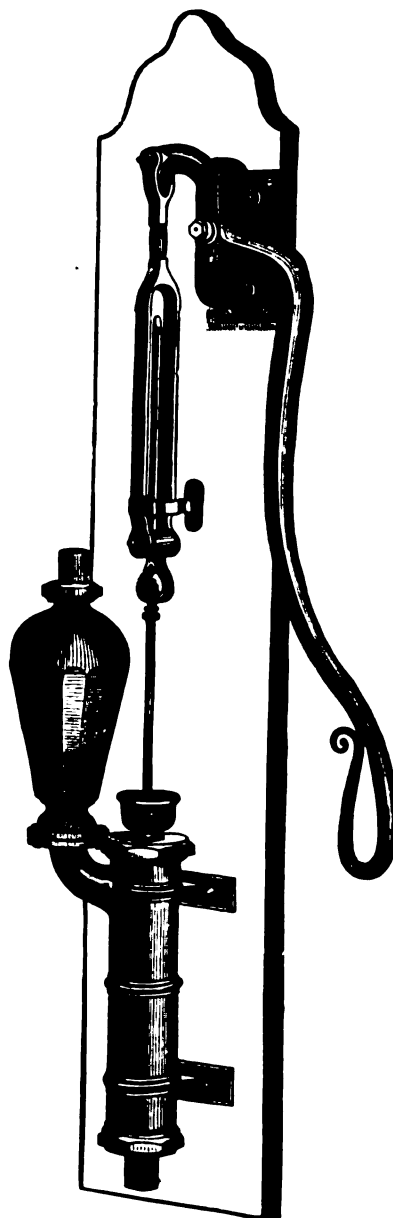


Plate 1079.

		Price				Price	
No.	Diam. of Cyl., in.	Size of Pipe, in.	Iron	Brass Cyl.	No.	Diam. of Cyl., in.	Size of Pipe, in.
1	2½	1¼	\$10 00	\$15 00	1	2½	1¼
2	3	1¼ or 1½	12 00	16 00	2	3	1¼ or 1½
3	4	1½ or 2	21 00	31 00	3	4	1½ or 2

HOUSE FORCE PUMP.

MOUNTED ON PLANK, WITH AIR CHAMBER.

**Plate 1080.**

	Iron	Brass Cylinder
No. 1, 2 inch Cylinder, size of Pipe, 1 inch	\$16 00	\$21 00
No. 2, 2½ inch Cylinder, size of Pipe, 1¼ inch	17 00	23 00
No. 3, 3 inch Cylinder, size of Pipe, 1¼ or 1½ inch	18 50	25 00

ALL BRASS.

No. 1, 2 inch Cylinder, size of Pipe, 1 inch	\$28 00
No. 2, 2½ inch Cylinder, size of Pipe, 1¼ inch	32 00
No. 3, 3 inch Cylinder, size of Pipe, 1¼ or 1½ inch	37 00
With Brass Cock on side of Air Chamber, add to list	5 00

TOM THUMB WIND-MILL FORCE PUMP.

FORKED ROD.

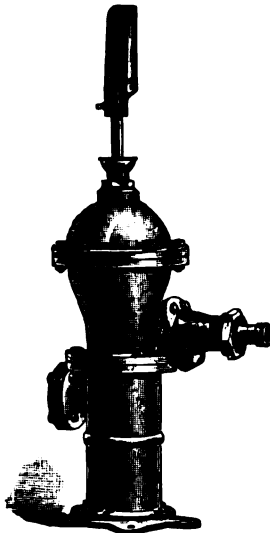


Plate 1081.

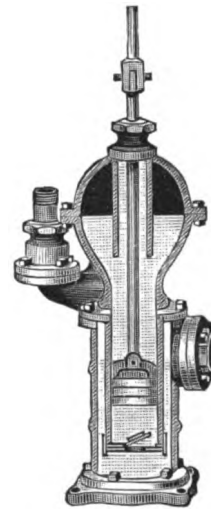


Plate 1082.

The above cuts illustrate a Wind-Mill Force Pump, for deep wells, the cut on the left showing the finished pump and that on the right being a sectional drawing showing the internal arrangement.

The suction orifice being situated at or near the top of the working cylinder, the valves are always submerged in from five to ten inches of water, keeping the pump primed at all times. We construct the inner cylinder of brass, with brass valve seat, making it non-corrosive; the outer cylinder is of iron; the rod is cased with brass, and works through a brass stuffing-gland. A knuckle joint is attached to the top of the rod for welding to, but a strap for attachment to wood will be sent when so ordered.

To remove Rod and Plunger from this Pump, the upper half of air chamber can be disconnected and the whole lifted off, and the lower valve can be reached without disconnecting any of the piping.

	Diam. Cylinder, Inches	Pipe, Inches		Eight-inch Stroke, Price	Ten-inch Stroke, Price	Twelve-inch Stroke, Price
No. 0	2	1	.....	\$21 50	\$25 25	\$30 50
No. 00	2½	1¼	.....	23 00	27 25	37 50
No. 1	3	1½	.....	25 25	30 50	40 00
No. 2	3½	1½	.....	27 25	37 50	45 00
No. 3	4	2	.....	30 50	40 00	50 00
No. 3½	4½	2	.....	37 50	45 00	54 00
No. 4	5	2½	.....	44 00	50 00	60 00
No. 4½	5½	2½	.....	47 00	56 00	66 00
No. 5	6	3	.....	50 00	64 00	78 00

The above sizes of pipes can be somewhat changed without affecting the efficiency of the pump. All parts of these pumps are made with special tools, so that they will interchange. Forked rod for wind-mill, \$3.00 extra.

THE FLORIDA FORCE PUMP.



Plate 1083.



Plate 1084.

This cut illustrates our new and improved Force Pump, the best and cheapest Pump of the class ever put on the market. It can be used on driven wells, on sinks over cisterns, for filling wash basins, bath tubs, tanks in upper rooms, etc. It has a greater capacity than many more expensive pumps; it will throw a continuous and powerful stream to a height of 40 feet or more, and when used with hose and our Gem or Lilly Nozzle, it will diffuse a poisonous solution over a wide area, and destroy insects, bugs, or worms which attack plants and trees. It is the best Spraying Pump ever offered to the trade, and as such, it will become invaluable to the farmer, orchardist and horticulturist.

Unless otherwise ordered, we shall always fit it for $\frac{3}{4}$ -inch hose.

PLATE 1083.

	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons	Pipe, Inches	Iron, Price	Copper-Lined Cylinder, Price
No. 0	2 $\frac{1}{2}$	5	$\frac{1}{10}$	1 $\frac{1}{4}$	\$ 9 00	\$11 25
No. 1	3 $\frac{1}{2}$	5	$\frac{1}{8}$	1 $\frac{1}{2}$	10 00	12 50

PLATE 1084.

	Diameter Cylinder, Inches	Stroke, Inches	Capacity, per Rev., Gallons	Pipe, Inches	Iron, Price	Copper-Lined Cylinder, Price
No. 0	2 $\frac{1}{2}$	5	$\frac{1}{10}$	1 $\frac{1}{4}$	\$11 50	\$13 75
No. 1	3 $\frac{1}{2}$	5	$\frac{1}{8}$	1 $\frac{1}{2}$	12 50	15 00

Plate 1084 same as Plate 1083, except Cock Spout as shown.

THE ALLWEILER FOUR-FOLD FORCE PUMPS.

HIGHEST AWARD AT THE WORLD'S FAIR.

Plate 1086 represents the Allweiler, as largely used for household purposes and by plumbers. The cylindrical shell of the pump is divided by the brass plunger and brass valves into four compartments, into which, diagonally, the liquid is drawn or forced through the brass plunger. As the lever is moved from left to right, the plunger moves upward in the left-hand compartments and downward in the right-hand compartments, and the liquid is drawn through the lower left-hand valve, passes through the plunger into the upper right-hand compartment and at the same time the liquid in the lower right-hand compartment is passing into the upper left-hand compartment and out of the pump. All this is accomplished with one-half stroke of the lever. Moving the lever from right to left duplicates the operation. Thus it will be seen that the Allweiler pumps four times as much water per stroke as other pumps.

The Allweiler will draw from 20 to 28 feet, the same as other pumps, and force it from 100 to 300 feet, depending on the size of the pump, and on account of its simplicity will force large quantities of water easier than other pumps, and is adapted to and arranged for all purposes.

There are no rubber parts. The pump is very compact, of large capacity, great strength and fitted with indestructible brass valves.

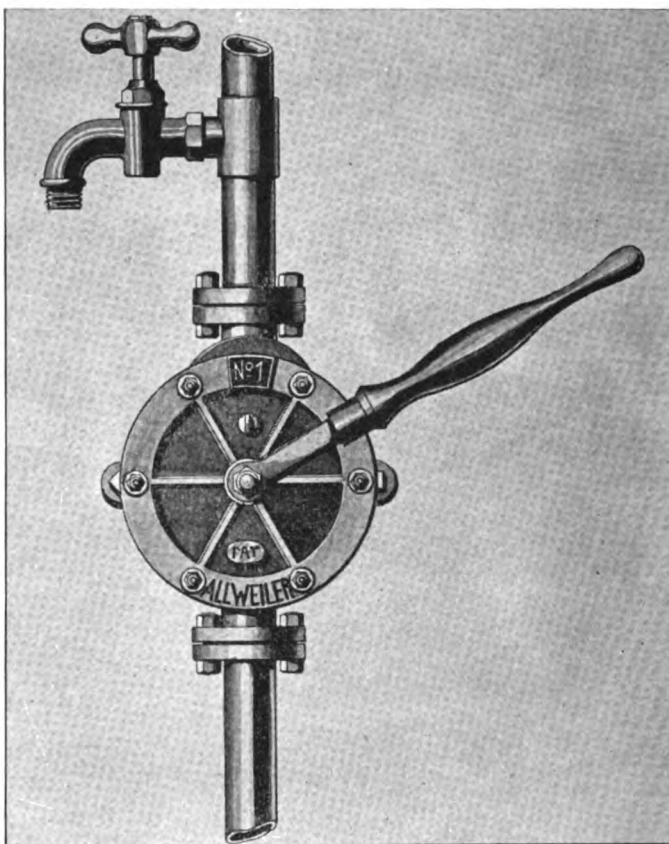


Plate 1085.

ALLWEILER FORCE PUMP.

PLATE 1086.

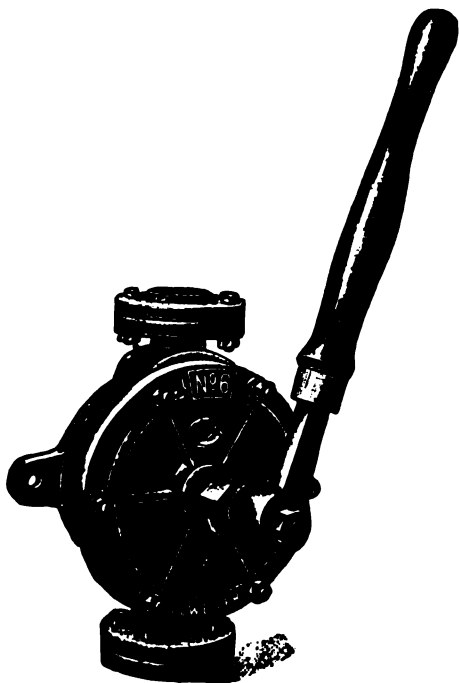
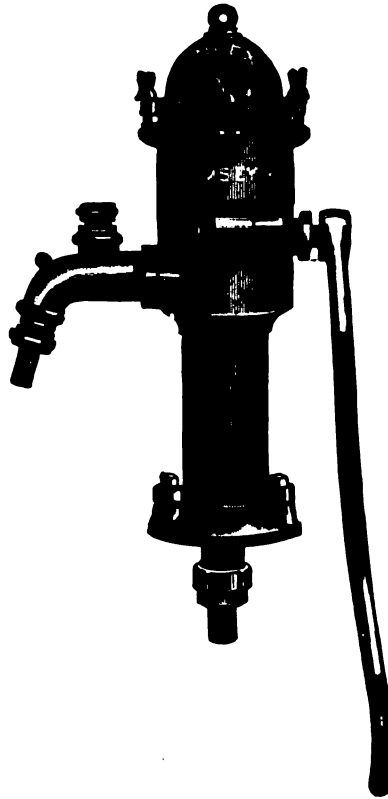


Plate 1086.

	Weight in Lbs.	Size of Pipe	Capacity in Gall., per Min.	Iron, Price	Brass, Price
No. 0	8	$\frac{1}{2}$ inch	8	\$13 00	\$17 00
No. 1	10	$\frac{3}{4}$ inch	10	15 00	20 75
No. 2	15	1 inch	15	17 25	27 00
No. 3	22	$1\frac{1}{4}$ inch	20	20 75	32 00
No. 4	28	$1\frac{1}{4}$ inch	25	23 75	38 00
No. 5	35	$1\frac{1}{2}$ inch	30	27 00	42 75
No. 6	54	$1\frac{1}{2}$ inch	36	32 25	62 00
No. 7	68	2 inch	47	40 25	82 50
No. 8	90	2 inch	60	48 75	103 00
No. 9	116	$2\frac{1}{2}$ inch	83	62 00	137 25
No. 10	156	3 inch	100	85 00	167 00
No. 11	174	3 inch	125	122 00	234 00

THE INDEX. NEW STYLE LIFT AND FORCE PUMP.**Plate 1087.**

The Index combines all the perfections of the Pitcher Spout Cistern Pump with the same ease of access to the working parts, and also contains all the valuable qualities of a Force Pump.

The Pump is provided with a Union Coupling on the base and is fitted for lead or iron pipe. The Valve Seat and Stuffing Gland are of brass.

DIRECTIONS FOR USE.

By unscrewing the Brass Plug, situated at the top of the Air Chamber, it is changed into an ordinary Lift Pump; the reverse action again changes it back to a powerful Force Pump. To gain access to the interior, remove the top of the Air Chamber by unscrewing the thumb-nuts which hold it in place.

No. 1, Diameter of Cylinder, $3\frac{1}{4}$ inches; Stroke, 5 inches; size of Pipe, $1\frac{1}{2}$ inches \$12 00

RUMSEY'S WATCH PUMPS.

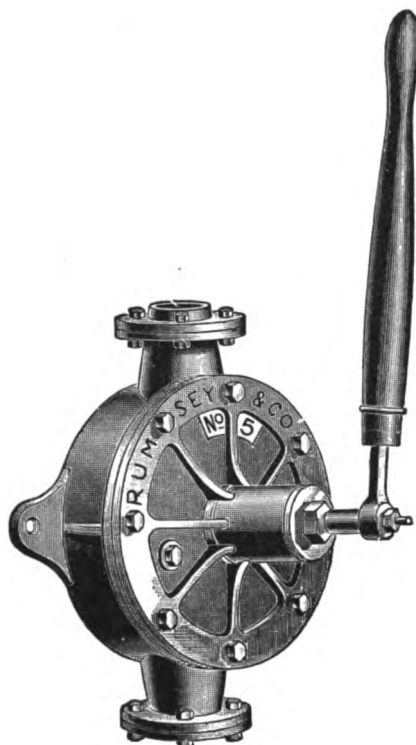


Plate 1088.

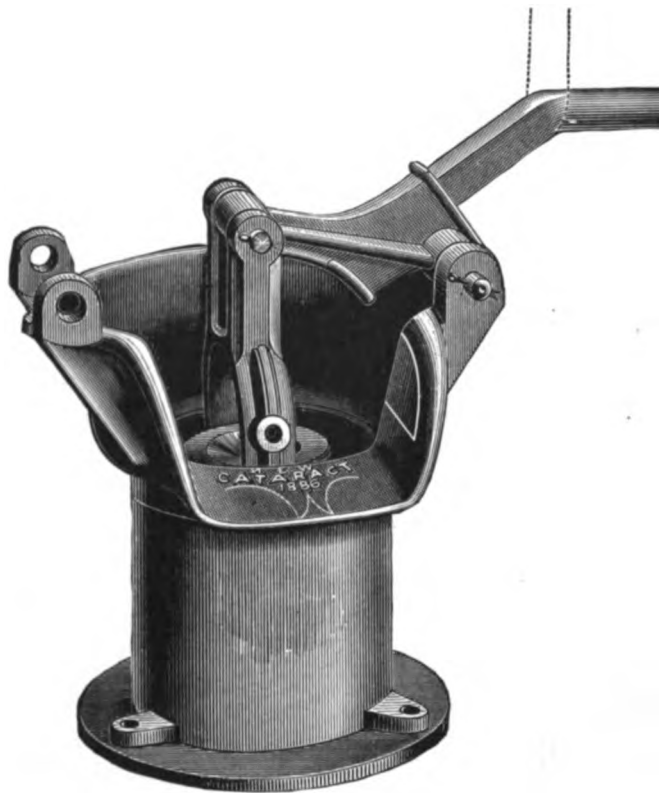
Plate 1088 is operated by means of a lever which may be worked either horizontally or vertically. By its construction very little power is consumed in friction. The valves are of Brass with Brass Wing Pistons, consequently these pumps can be used to pump hot or cold liquids, wines, oil, cider, acids, etc. The pipe connections are flanged so that Pump can be removed at any time without disturbing the pipes.

	Suc. and Disch. Fitted for Pipe, Inches	Approximate Capacity per Hour, Gallons		Iron, Price	Brass, Price
No. 1	$\frac{1}{2}$	264	.....	\$ 5 00	\$ 7 00
No. 2	$\frac{3}{4}$	352	.....	6 00	9 00
No. 3	1	427	.....	7 25	12 50
No. 4	$1\frac{1}{4}$	634	.....	9 00	15 00
No. 5	$1\frac{3}{4}$	950	.....	10 00	18 75
No. 6	2	1,346	.....	12 00	21 25

The Iron Pumps have Brass Valves, Brass Valve Box and Brass Wing Piston.

CATARACT. NEW STYLE.**PERFECTION OF LOW-PRICED PUMPS.**

**FOR CONTRACTORS, MINES, QUARRIES, BARGES, VESSELS AND ALL PURPOSES WHERE LARGE
QUANTITIES OF WATER HAVE TO BE RAISED.**

**Plate 1089.**

The Cylinder is lined with heavy copper.

The Valves are faced with pure gum rubber, and are so arranged that they can be readily withdrawn for the purpose of sounding, or for repairs.

The Lever is so arranged that it can be used horizontally or vertically.

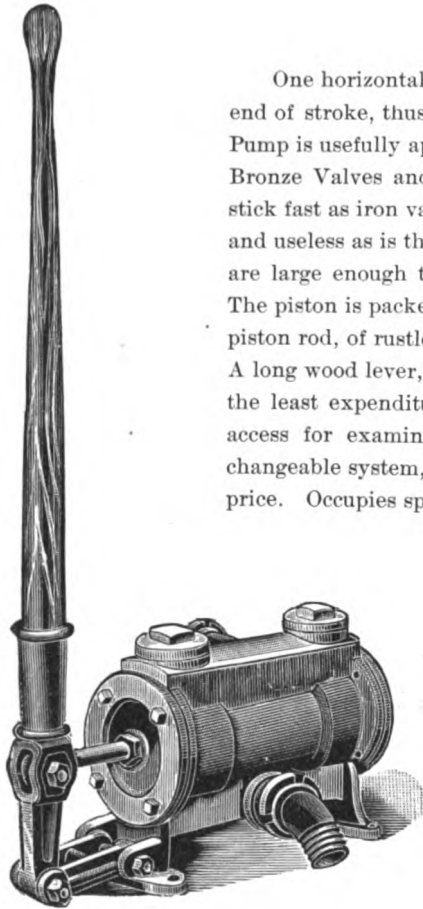
	Suction, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Revolution, Gallons	Price
No. 1	2½	6	4½	½	\$20 00
No. 2	3	8½	6½	1½	25 00

RUMSEY DOUBLE-ACTING THRESHER FORCE PUMP.

FOR FILLING THRESHER WAGON TANKS FOR BOILER SUPPLY.

DESCRIPTION.

One horizontal pumping cylinder taking water at each end of stroke, thus the whole force exerted in working the Pump is usefully applied to raising and forcing the water. Bronze Valves and Valve Seats, which will not rust and stick fast as iron valves and valve seats do, nor become stiff and useless as is the case with leather valves. Water-ways are large enough to reduce friction to the lowest point. The piston is packed with double crimped leather, and the piston rod, of rustless steel, works in a bronze stuffing-box. A long wood lever, easily detachable, works the pump with the least expenditure of strength. All parts are easy of access for examination or repairs. Made on the interchangeable system, repairs can be furnished at a minimum price. Occupies space 9 x 20 inches.

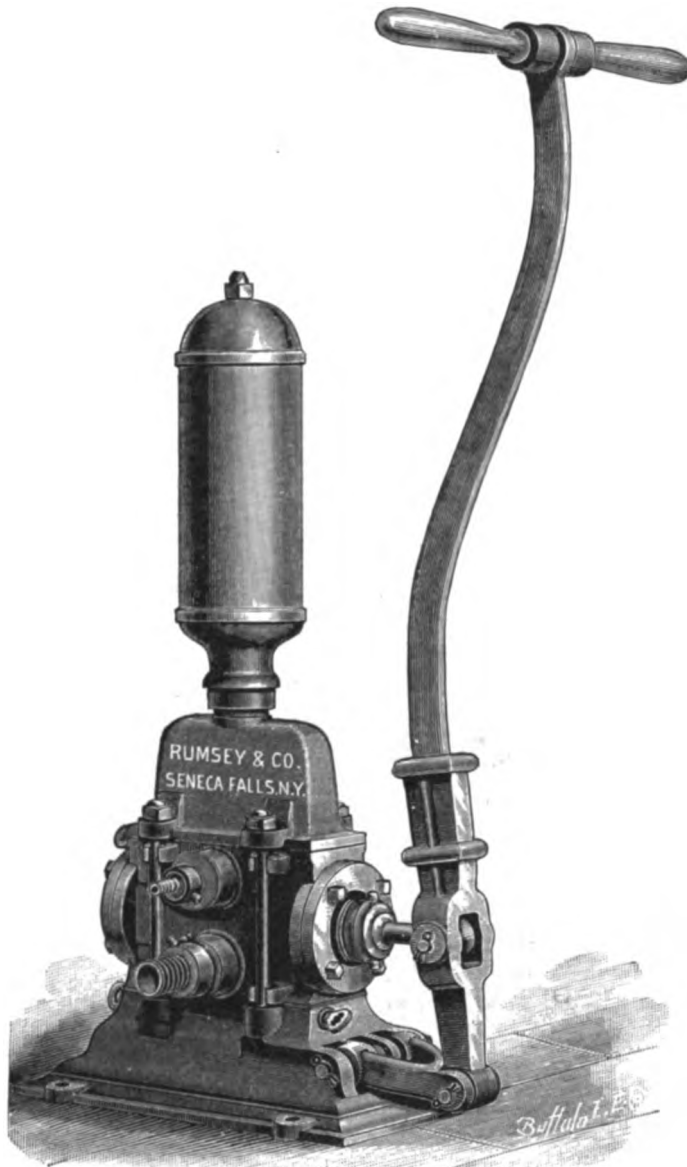


EMPLOYMENT.

For filling thresher wagon tanks for boiler supply, draining cellars, cess-pools and barn-yards, irrigation, cleaning out boilers, washing windows and wagons, spraying fruit trees and vegetation, and for fire protection.

Plate 1090.

	Suction and Disch. Hose, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons	Price
No. 1	2	5	5	$\frac{8\frac{1}{2}}{100}$	\$18 00

THE MONARCH.**HORIZONTAL DOUBLE-ACTING FORCE PUMP.****Plate 1091.**

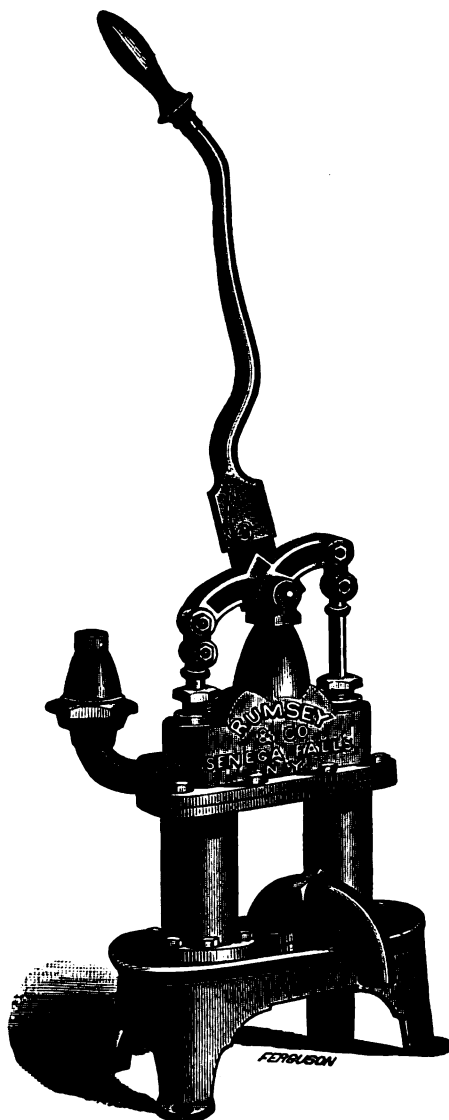
The air chamber has been greatly increased in size, so that the pump throws a very steady and powerful stream. It is designed to take suction and to discharge on either or both sides. It is especially useful as a spraying pump. We make but one size. Cylinder, 3 inches by 5 inches. Suction, $1\frac{1}{4}$ inch; discharge, 1 inch. The suction and discharge are fitted with brass hose connections. Valves and Valve Seats all brass.

PLATE 1091.

Iron	\$ 28 00
Brass Cylinder	58 00
All Brass	120 00

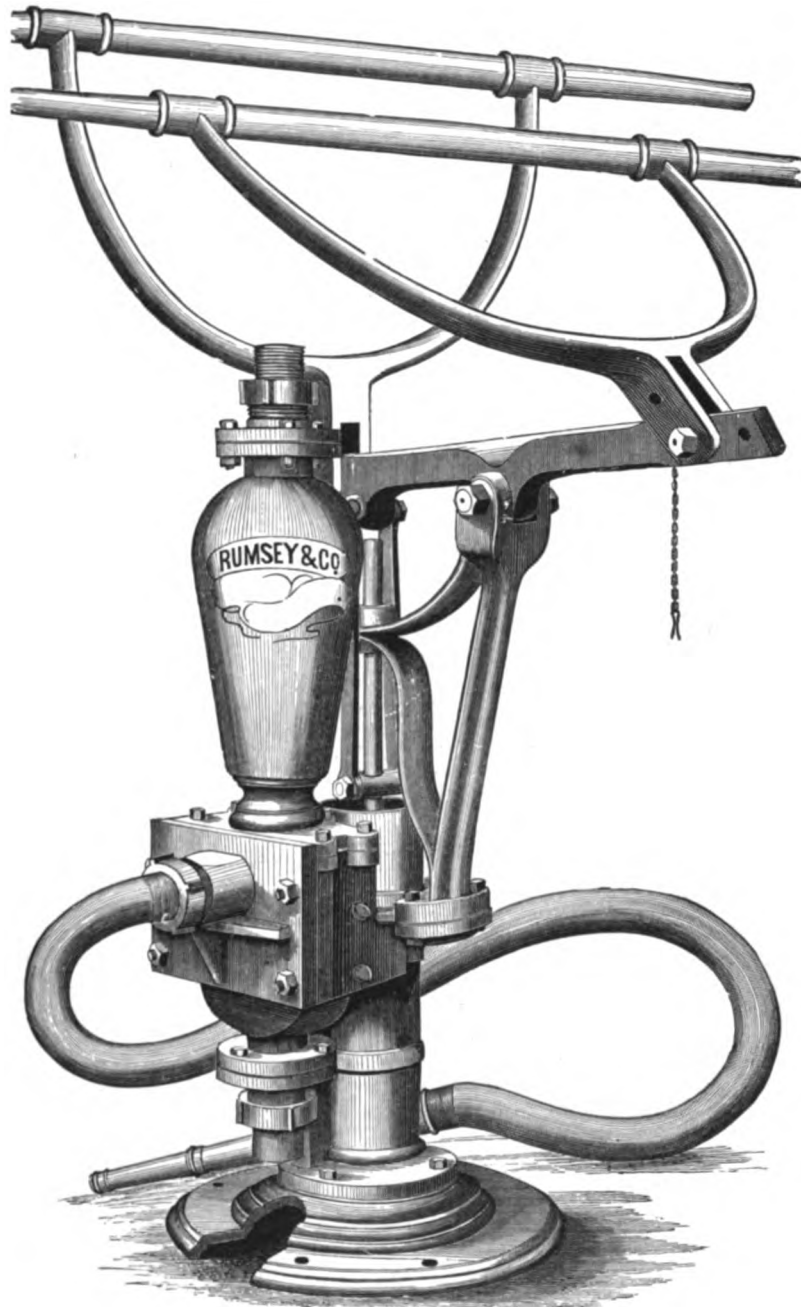
BRASS DOUBLE-CYLINDER FORCE PUMP.

FOR HOUSE OR SHIP USE.

**Plate 1092.**

The accompanying cut represents our Two-Cylinder Ship and House Force Pump. It is durable and well arranged in all its parts, having an exceedingly perfect adaptation for its work. Among the many points that will commend it to the trade and practical pump men, are the vertically working double pistons and nearly horizontal working-lever; while it combines compactness with great capacity. Brass plugs are provided at all necessary points for entirely emptying the pump of water in cold weather. The discharge tube is brass screwed for iron pipe or for soldering on brass or copper pipe, and held in place by a union-nut coupling. The cylinders, rods, stuffing-glands and air chamber are all brass.

	Fitted for Pipe, Inches	Diam. Cylinder, Inches	Capacity per Revolution	Price
No. 2	1¼	2½	1½ gallons	\$35 00

PACIFIC DOUBLE-ACTING RAILROAD FORCE PUMP.**Plate 1093.**

It has room on the brakes for six men, having all the force of an ordinary hand fire engine; on account of folding brakes, add \$20.00 to the list.

Prices shown with Plate 1095.

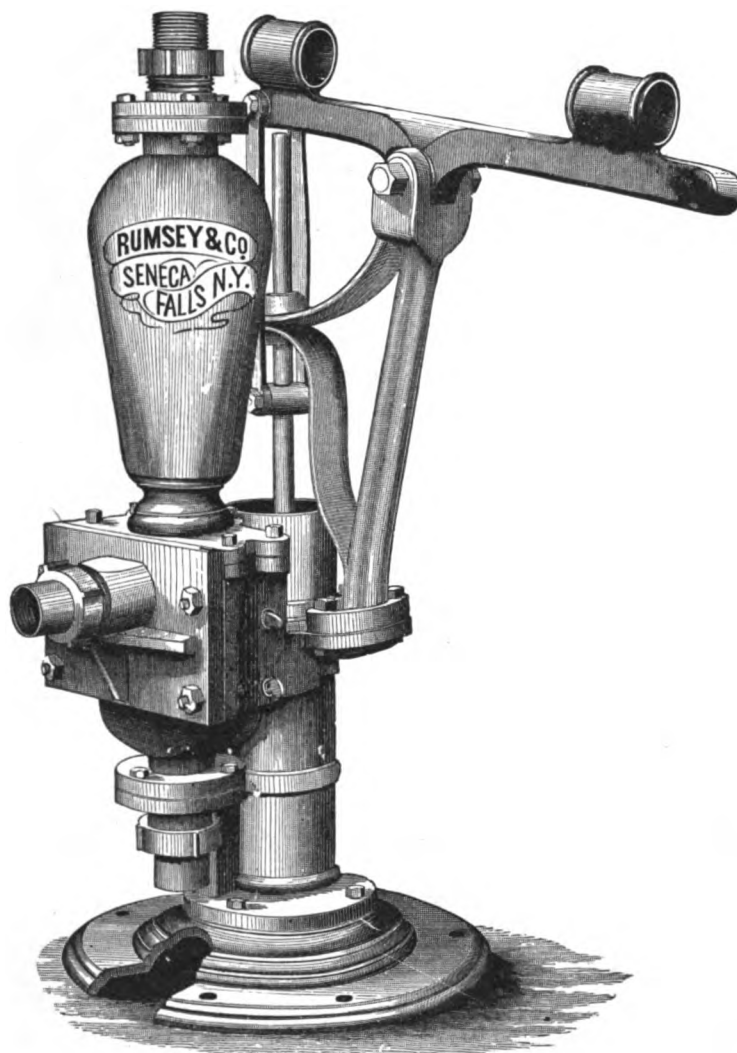
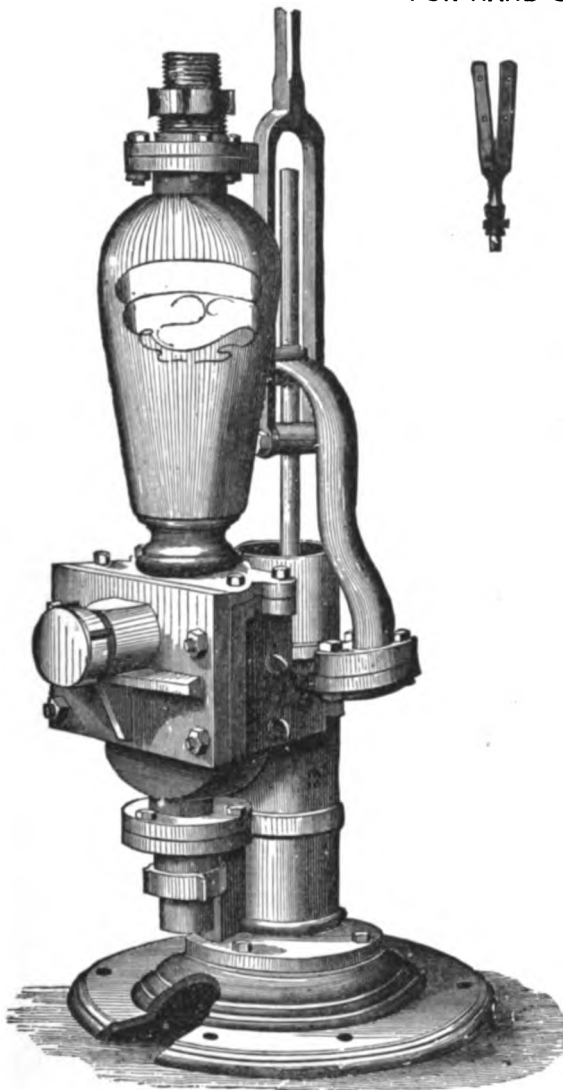
PACIFIC DOUBLE-ACTING RAILROAD FORCE PUMP.**Plate 1094.**

Plate 1094 represents our Pacific Double-Acting Railroad Force Pump, with brake for hand power. These styles are all made with working parts and valves entirely similar. For description and prices, see list shown with Plate 1095.

PACIFIC DOUBLE-ACTING RAILROAD FORCE PUMPS.**FOR HAND OR POWER.****Plate 1095.**

The Plates 1093, 1094 and 1095 represent styles of our Double-Acting Force Pumps designed especially for the use of railroad corporations, distillers, paper mills, etc., or for other parties who require a very powerful pump to raise a large quantity of water.

These pumps are so constructed that all parts are easy of access in case of necessity. All the valves are bronze with a rubber facing, and are the best variety of poppet valve. The valve seats are also of bronze, screwed in, and can be readily taken out and replaced at any time by simply removing the face plate, without disturbing any other part of the pump. The induction and education pipes can be attached or detached without any trouble, as all the joints are in plain sight on the front of the pump. The piston rod is of gun metal, with solid cross-head. The cylinders are bored and polished equal to any steam engine cylinder. The stuffing-box is surrounded by an oil or water chamber which prevents the admission of air into the pump on the downward stroke. It will, therefore, be readily seen that these pumps combine the necessary attributes to make them always perfect double-acting force pumps.

	Diam. of Cylinder	Length of Stroke	Capacity per Stroke	Size of Pipe	Iron Price	Brass Lined Cylinder Price
No. 26	3 inch	8 inch	$\frac{1}{2}$ gallon	1 $\frac{1}{2}$ inch	\$ 65 00	\$ 75 00
No. 26	3 inch	10 inch	$\frac{1}{6}$ gallon	1 $\frac{1}{2}$ inch	70 00	78 00
No. 26	4 inch	8 inch	$\frac{3}{8}$ gallon	2 inch	75 00	79 50
No. 26	4 inch	12 inch	1 $\frac{1}{4}$ gallon	2 inch	100 00	111 00
No. 26	4 inch	14 inch	1 $\frac{1}{2}$ gallon	2 inch	110 00	125 00
No. 26	5 inch	8 inch	1 $\frac{1}{3}$ gallon	2 $\frac{1}{2}$ inch	90 00	110 00
No. 26	5 inch	14 inch	2 $\frac{2}{3}$ gallon	2 $\frac{1}{2}$ inch	130 00	165 00
No. 26	6 inch	8 inch	2 gallon	3 inch	110 00	135 00
No. 26	6 inch	14 inch	3 $\frac{2}{3}$ gallon	3 inch	175 00	215 00
No. 26	8 inch	10 inch	4 $\frac{1}{3}$ gallon	4 inch	275 00	325 00

Plate 1093, with folding brakes, \$20.00 extra.

EXCELSIOR HORIZONTAL DOUBLE-ACTING SUCTION AND FORCE PUMP.

WITH CRANK SHAFT AND PULLEYS. FOR POWER.

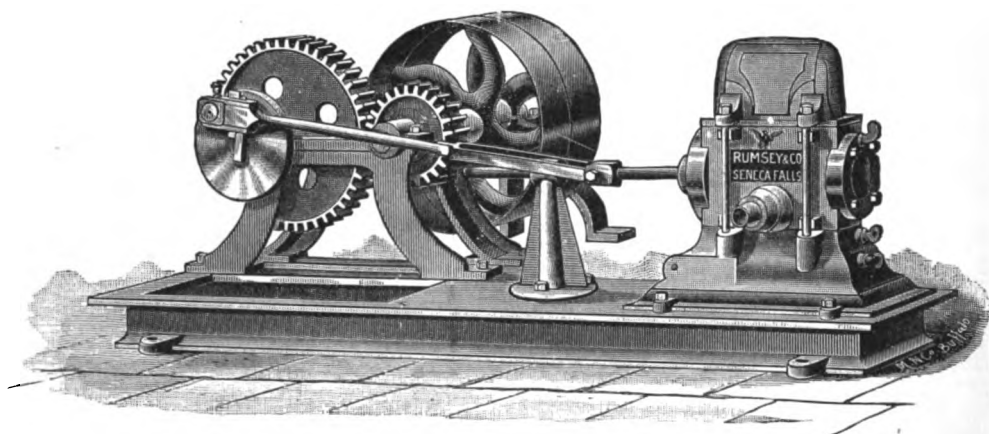
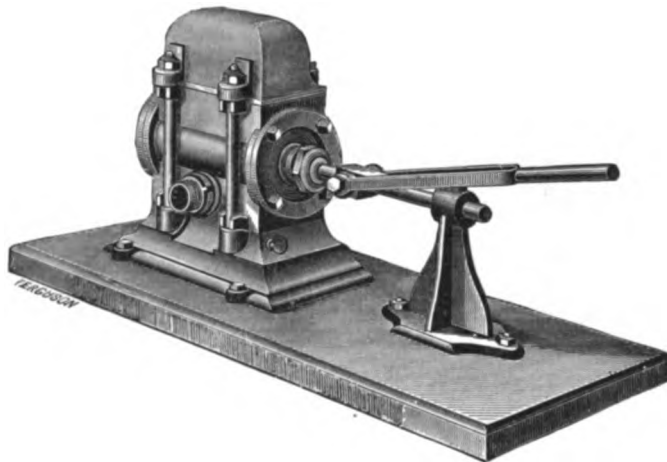


Plate 1096.

The cut shows another adaptation of our Excelsior Force Pump for running by power from a belt. This is the most complete and compact pump of the kind yet placed upon the market, and has no superior in point of construction. It is mounted on iron bed plate, with crank and turned tight and loose pulleys. All the valves are easily accessible by unscrewing the bolts and lifting off the air chamber, without disturbance to the suction pipe. The pump is provided with brass plugs for emptying it in cold weather. The Crank Shaft is made of sufficient length to take a hand crank, and is supported by strong bearing, lined with antifriction metal. The Piston Rods, Valves and Valve Seats are all of gun metal, and all parts of the pump liable to wear are made extra heavy strong, to sustain severe and continued labor of long duration. They can be run from 40 to 80 revolutions per minute. If not otherwise ordered, we fit them for wrought iron pipe connections, but when desired we arrange them for either hose or lead pipe without extra charge. For forcing water through hose for extinguishing fires, or for all general purposes and uses to which a pump of this class is adaptable, we can confidently recommend it in the highest terms.

	Suction, Inches	Discharge, Inches	Diam. Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons	Iron, Price	Brass Cylinder, Price
No. 1	1¼	1¼	3	5	1⅓	\$ 70 00	\$100 00
No. 2	1½	1½	4	5	1½	75 00	115 00
No. 3	2	2	5	5	1⅝	100 00	155 00
No. 4	2½	2½	6	5	1⅞	115 00	189 00

An Iron Wrench, fitting all Nuts, Stuffing-Gland and Hose Coupling, goes with each Pump.

EXCELSIOR HORIZONTAL DOUBLE-ACTING FORCE PUMP.**WITH WROUGHT IRON PITMAN, BRONZE ROD AND GUIDE.****Plate 1097.**

The above cut represents our Excelsior Force Pump, fitted with Wrought Iron Pitman and Bronze Guide and Rod, for attaching to power. This is an excellent arrangement for filling tanks or for fire purposes, and is also extensively in use at railway watering stations, for operating by horse power. It can safely be run at 50 revolutions per minute, and in cases of emergency at a much higher rate of speed. Fitted for gas pipe unless otherwise ordered. The iron Pumps have copper lined Cylinders. An Iron Wrench, fitting all Nuts, Stuffing Gland and Hose Couplings, accompanies each Pump.

	Suction, Inches	Dis- charge, Inches	Diam. Cyl., Inches	Stroke, Inches	Capacity per Rev., Gallons		Iron, Price	Brass Cylinder, Price
No. 1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	3	5	$\frac{3}{16}$	.....	\$30 00	\$60 00
No. 2	1 $\frac{1}{2}$	1 $\frac{1}{2}$	4	5	$\frac{1}{2}$	.....	32 00	62 00
No. 3	2	2	5	5	$\frac{5}{8}$	.....	47 00	91 00
No. 4	2 $\frac{1}{2}$	2 $\frac{1}{2}$	6	5	1 $\frac{3}{8}$	.....	50 00	123 00

NEW STYLE HORIZONTAL DOUBLE-ACTING SHIP PUMP.

FOR WASHING OFF DECKS, WETTING SAILS, EXTINGUISHING FIRES, ETC.

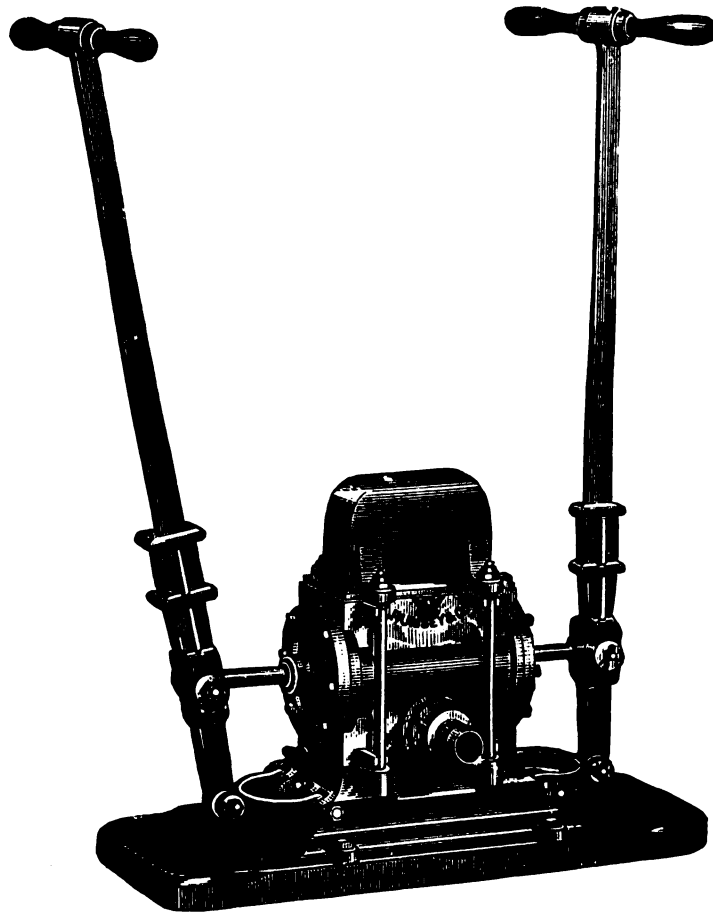
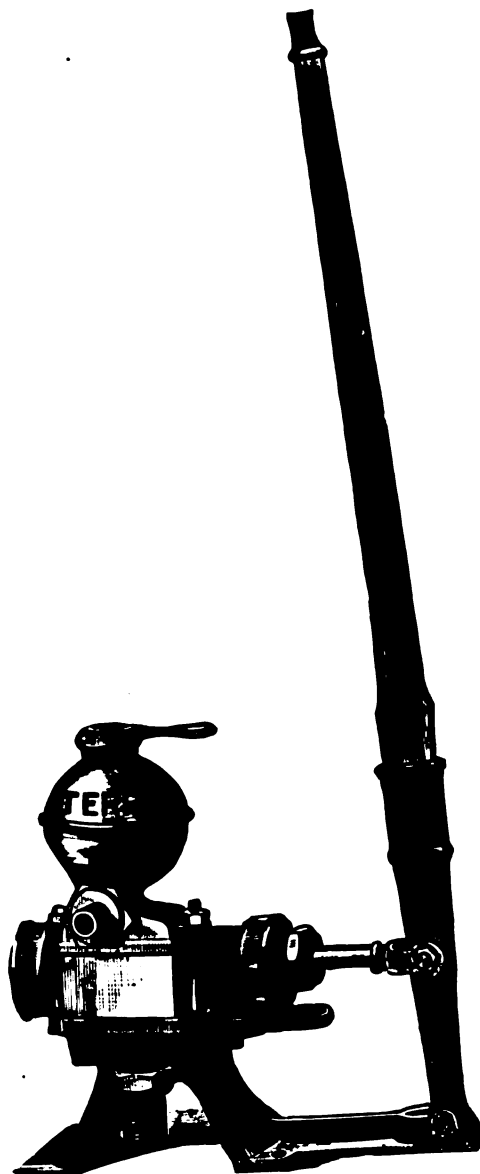


Plate 1098.

The above cut represents a Horizontal Double-Acting Ship Pump. It is very useful for elevating large quantities of water from wells or reservoirs, and the most convenient Pump of the class ever invented for use on shipboard as a Force Pump for washing decks, extinguishing fires, etc. All parts exposed to the action of salt water being made non-corrosive, it is peculiarly adapted for vessels making long voyages.

	Suction, Inches	Discharge, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons	Iron, Price	Brass Cylinder, Price
No. 1	2	2	5	5	1 ⁸ / ₁₀	\$45 00	\$ 95 00
No. 2	2½	2½	6	5	1 ² / ₁₀	55 00	125 00

RUMSEY'S TERROR.**A HORIZONTAL DOUBLE-ACTING PUMP OF SUPREME EXCELLENCE.****Plate 1099.**

The accompanying engraving is an illustration of our new Horizontal Double-Acting Force Pump. This Pump contains all modern improvements, such as Vertical Suction, Double Discharges, Bronze Rod and Stuffing Gland, Lever Stop to prevent the straining of the Rod, Sliding Fulcrum, Drip Dish, Let-off Plugs, etc. The removal of two Bolts gives access to the Valve system. The removal of the Cylinder-head gives easy access to the Piston and all working parts of the Pump. It is made on the interchangeable system so that repairs to supply breakages will replace the broken parts with certainty.

	Suction, Inches	Disch. Inches	Diam. Cyl., Inches	Stroke, Inches	Capacity per Rev., Gallons	Iron, Price	Brass Cylinder, Price
No. 1	1	1	2½	5	½	\$16 00	\$18 00

EXCELSIOR HORIZONTAL DOUBLE-ACTING SHIP PUMP.

WITH COPPER-LINED CYLINDER, ADJUSTABLE LEVER, METALLIC VALVES, ETC.

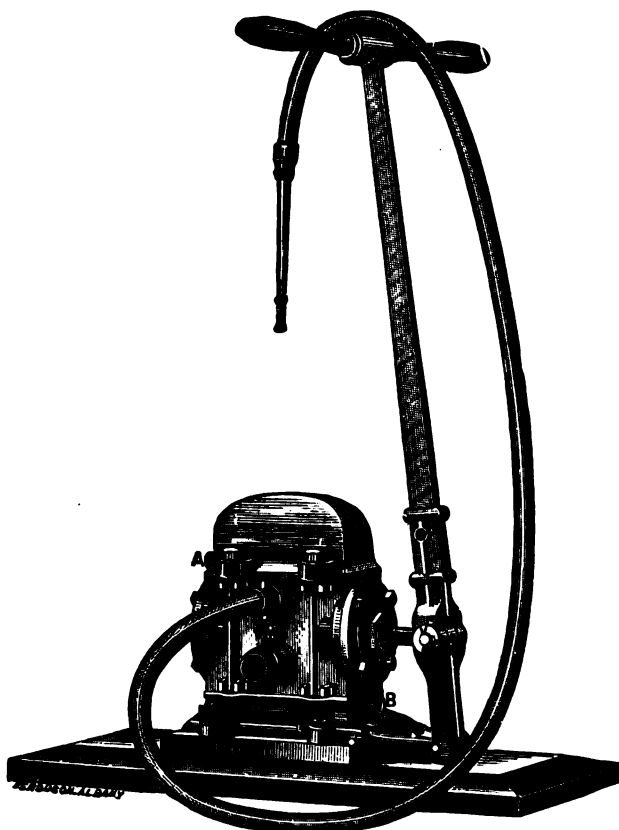
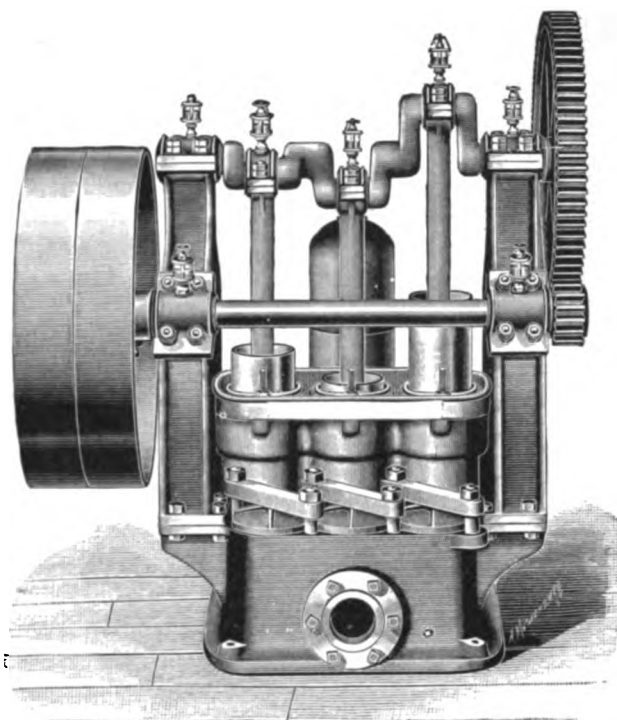


Plate 1100.

The above cut represents our Double-Acting Horizontal Force Pump. The cylinder is lined with copper; the piston-rod, valves and seats are made of bronze. All parts of this Pump exposed to the action of water are non-corrosive. It is compact, strong, simple, durable and unequaled by any Pump of the kind in use. It is especially valuable on board ships, for washing decks, wetting sails or extinguishing fires; and equally invaluable on wharves or around factories, mills, warehouses, livery stables, lumber yards, etc., for a fire Pump and other purposes. The water-ways are large and direct, and its general arrangement such that it can be easily overhauled. All water can be drawn out by simply unscrewing the let-off plugs, situated at each end of the cylinder for this purpose, thus rendering the Pump anti-freezing in the coldest latitudes. All the valves can be examined and removed if necessary, by taking off the brass nuts of the four bolts holding all the parts together. A priming plug is placed at the upper back end of the cylinder, enabling the cylinder to be lubricated, or the valves primed when required. All appurtenances for fitting, etc., go complete with each Pump. Arranged for hose, and lead or iron pipe connections. Prices quoted below do not include hose.

	Suction, Inches	Discharge, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons		Iron. Price	Brass Cylinder. Price
No. 1	1¼	1¼	3	5	1⅓	.....	\$28 00	\$ 58 00
No. 2	1½	1¼	4	5	½	.....	32 00	60 00
No. 3	2	2	5	5	1⅞	.....	35 00	90 00
No. 4	2½	2½	6	5	1½	.....	45 00	120 00

TRIPLE-CYLINDER POWER PUMP.**Plate 1101.**

In the Triple-Cylinder Power Pump, the three plungers work from cranks on the same axis and give a practically intermittent movement to the fluid pumped, producing a perfectly steady pressure or vacuum as the case may require.

This steadiness of action produces many desirable results. It is very easy on belting, and consequently so on the power. It does not destroy itself by the sudden change of the crank, as in ordinary pumps is likely to be the case, because the strain is a constant one, and the percentage of efficiency is heightened. These features allow the operation of this pump by electric motors, by eliminating the hitherto objectionable features of Piston Pumps in this service.

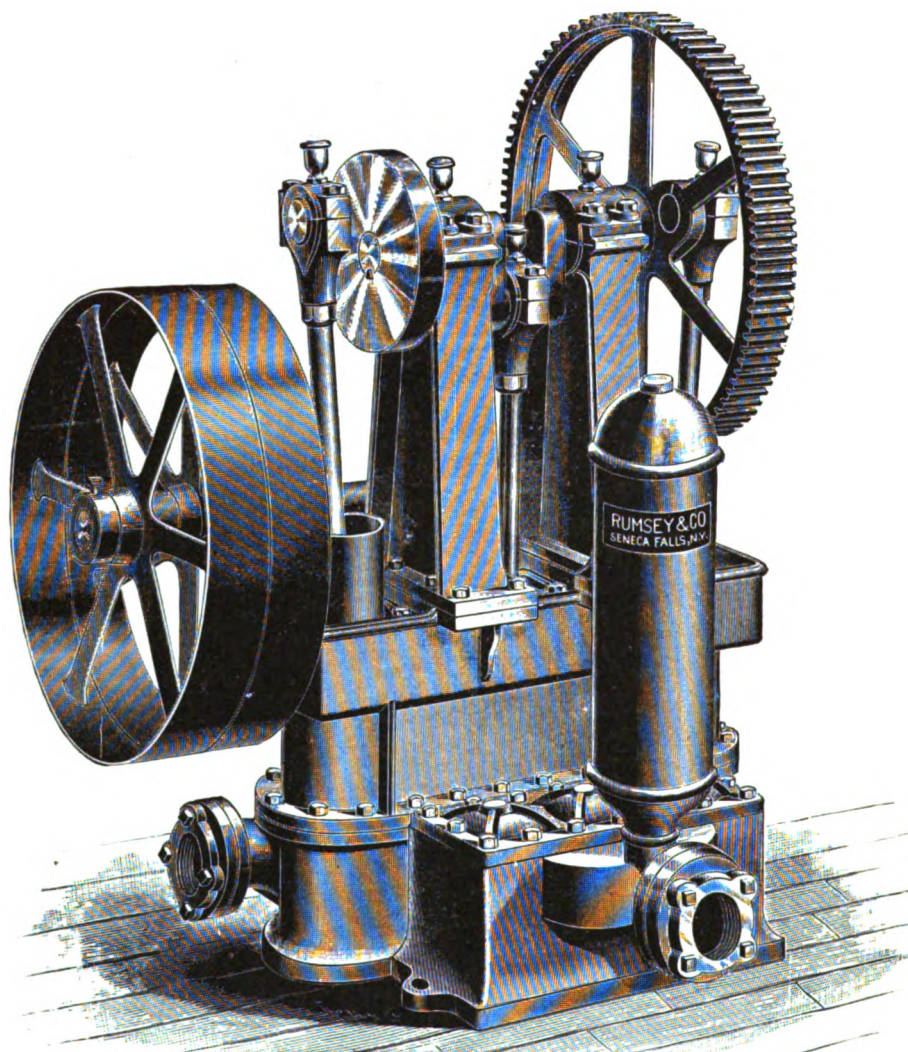
We particularly recommend these Pumps for electric motors, open tank or pressure tank hydraulic elevators, for paper mills, for stuff and suction pumps, for pulp grinders, for water works, for circulating pump, for steam heating system and boiler feeding.

We solicit correspondence with those who wish a good Power Pump.

PRICE LIST AND CAPACITIES TRIPLEX PUMPS.

Diam. of Cyl., Inch	Length of Stroke, Inch	Diam. of Suction, Inch	Diam. of Discharge, Inch	Ratio of Gearing, Inch	Dia. & Face of T. & L. Pulleys, Inch	Gallons per Revolution	Revolutions for 200 Feet	Revolutions for 300 Feet	Shipping Weight About, Lbs.	Price as Shown
2½	4	1½	1½	5 to 1	15 x 3	¼	60	40	350	\$125 00
3	4	1½	1½	5 to 1	15 x 3	⅓	60	40	500	140 00
4	4	2½	2	5 to 1	20 x 3	⅝	45	35	750	200 00
4	6	2½	2	5 to 1	20 x 3	1.	45	30	800	250 00
4	8	2½	2	5 to 1	20 x 3	1.3	45	30	900	275 00
5	6	3	2½	5 to 1	26 x 4	1.5	40	30	1600	330 00
5	8	3	2½	5 to 1	26 x 4	2.	40	30	1800	375 00
6½	8	4	4	5 to 1	30 x 6	3.25	40	30	3600	575 00
7	8	4	4	5 to 1	30 x 7	4.	40	30	4000	625 00
8	8	5	4	5 to 1	36 x 6	5.25	35	25	5800	700 00
8	10	5	4	5 to 1	36 x 6	6.5	35	25	6750	800 00

Larger sizes or pumps for special work built according to specifications. These Pumps fitted with Valves for hot or cold water as desired, or with Ball Valves for handling pulp.

RUMSEY'S TRIAD TRIPLEX POWER PUMP.**Plate 1102.**

Diameter Cylinder, Inches	Stroke, Inches	Suction, Inches	Discharge, Inches	Pulleys, Inches	Gallons per Revolution	R. P. M. of Crank	Price
1 $\frac{1}{4}$	2	$\frac{3}{4}$	$\frac{3}{4}$	12 x 1 $\frac{1}{2}$	$\frac{1}{3}$	50	\$ 50 00
1 $\frac{3}{4}$	2 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	12 x 2 $\frac{1}{2}$	$\frac{1}{4}$	50	75 00
2	3	1 $\frac{1}{4}$	1 $\frac{1}{4}$	12 x 2 $\frac{1}{2}$	$\frac{1}{8}$	50	100 00
2 $\frac{1}{2}$	4	1 $\frac{1}{2}$	1 $\frac{1}{2}$	15 x 3	$\frac{1}{4}$	50	125 00
3	4	1 $\frac{1}{2}$	1 $\frac{1}{2}$	15 x 3	$\frac{1}{2}$	45	140 00
4	4	2 $\frac{1}{2}$	2	18 x 3	$\frac{5}{8}$	45	200 00
4	6	2 $\frac{1}{2}$	2	20 x 3 $\frac{1}{2}$	1	40	250 00
5	6	3 $\frac{1}{2}$	3	24 x 5	1 $\frac{1}{2}$	40	285 00
5	8	3 $\frac{1}{2}$	3	24 x 6	2	40	330 00
6	8	4	3 $\frac{1}{2}$	28 x 7	2 $\frac{1}{2}$	40	490 00
7	8	5	4	28 x 8 $\frac{1}{2}$	4	40	600 00
8	8	6	5	30 x 10 $\frac{1}{2}$	5 $\frac{1}{4}$	35	700 00
8	10	6	5	36 x 12 $\frac{1}{2}$	6 $\frac{1}{2}$	35	900 00

The above Pumps are all geared for five revolutions of countershaft for one of crank shaft.

KNOWLES' VERTICAL TRIPLEX BELTED POWER PUMP.

STYLE B.

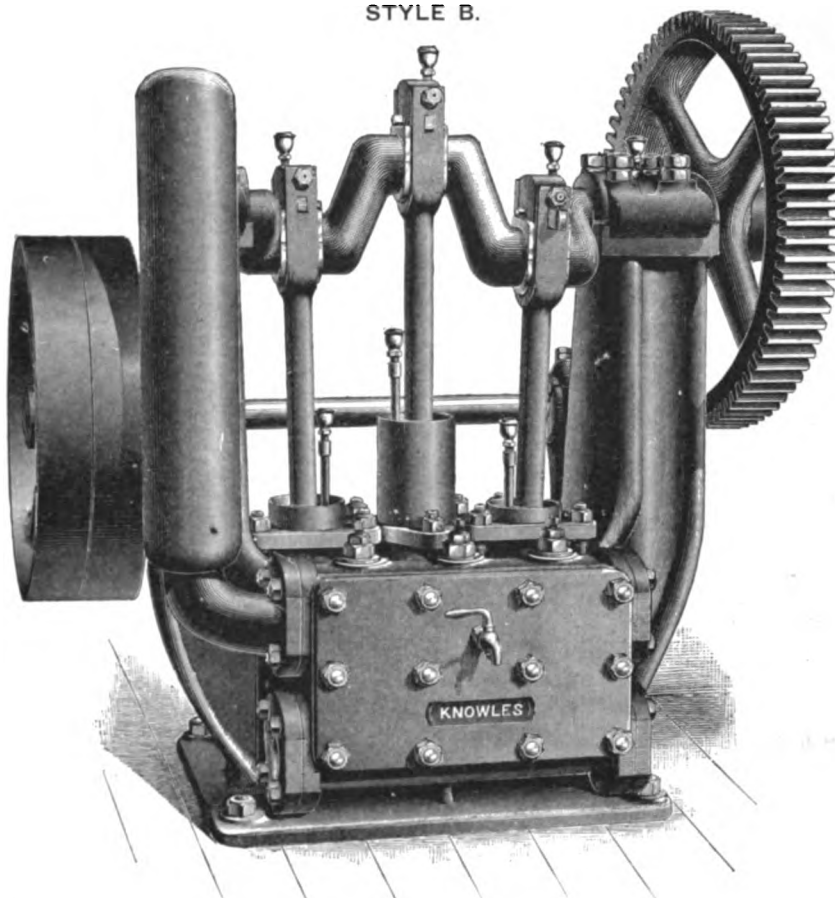


Plate 1103.

Diam. of Cylinders	Stroke	Suction	Discharge	Gallons per Rev- olution	Revolutions per Min.	Gallons per Minute	Tight and Loose Pulleys	Ratio of gearing	Weight Complete	Style of gearing	Height, Over all	Width, Over all	Depth, Over all	Price	
											Ft.	In.	Ft.	In.	
1 1/4	2	3/4	3/4	.0319	60	1.914	12x2 1/2	5 to 1	164	B	19 1/2	16 7/8	12 3/4	12 3/4	.....
1 3/4	2 1/2	1 1/4	1 1/4	.0732	60	4.392	12x2 1/2	5 to 1	373	B	27	23 1/2	15 1/2	15 1/2	.....
2	3	1 1/4	1 1/4	.1224	50	6.120	12x2 1/2	5 to 1	370	B	27	23 1/2	15 1/2	15 1/2	.....
2 1/2	4	1 1/2	1 1/2	.2550	50	12.75	15x3	5 to 1	400	B	29	31 7/8	23	23	.....
3	4	1 1/2	1 1/2	.3673	45	16.53	15x3	5 to 1	675	B	29	31 7/8	23	23	.....
4	4	2	2	.6528	45	29.37	20x3	5 to 1	738	B	39 3/8	38 1/4	28 1/4	28 1/4	.....
4	6	2	2	.9787	40	39.15	20x3	5 to 1	1,228	B	39 3/8	38 1/4	28 1/4	28 1/4	.....
5	6	3	3	1.530	40	61.20	26x4	5 to 1	1,689	B	48 1/2	46 3/8	34 7/8	34 7/8	.....
5	8	3	3	2.040	40	81.60	30x5	5 to 1	1,840	B	48 1/2	46 3/8	36 7/8	36 7/8	.....
6 1/2	8	4	4	3.448	40	137.92	30x6	5 to 1	3,648	B	59	62 3/4	42 1/2	42 1/2	.....
8	8	5	4	5.222	40	208.88	36x6	5 to 1	5,500	B	62	70 3/4	49 1/2	49 1/2	.....
8	10	5	4	6.520	40	260.8	40x6	5 to 1	6,725	B	65	74 1/2	51 1/2	51 1/2	.....
8	12	5	4	7.833	40	313.32	42x6	6 to 1	12,100	A	8 9	7 37/8	6 9	6 9	.....
9	10	6	5	8.262	40	330.48	42x6	6 to 1	12,900	A	8 2	7 5	6 9	6 9	.....
9	12	6	5	9.915	40	396.60	42x6	6 to 1	13,800	A	8 10	7 5	6 9	6 9	.....
10	12	8	7	12.243	40	489.72	*42x8	6 to 1	14,000	A	8 10 1/2	7 7 1/8	6 9	6 9	.....
11	12	8	7	14.811	40	592.44	*42x8	6 to 1	16,000	A	8 10 1/2	7 10 1/8	6 9	6 9	.....
12	12	10	8	17.628	40	705.12	*48x8	6 to 1	19,650	A	9 1	8 10	7 2	7 2	.....
13	12	10	8	20.685	40	827.40	*48x10	6 to 1	22,450	A	9 1	9 1	7 2	7 2	.....

*Belt should be double.

NOTE.—First three sizes have one discharge opening (in front) and suction on each side. All other sizes have both suction and discharge openings on each side. For pressures above 125 lbs. per sq. in.

KNOWLES' HORIZONTAL TRIPLEX ELECTRIC POWER PUMP.

WITH SINGLE-ACTING OUTSIDE PACKED PLUNGERS.

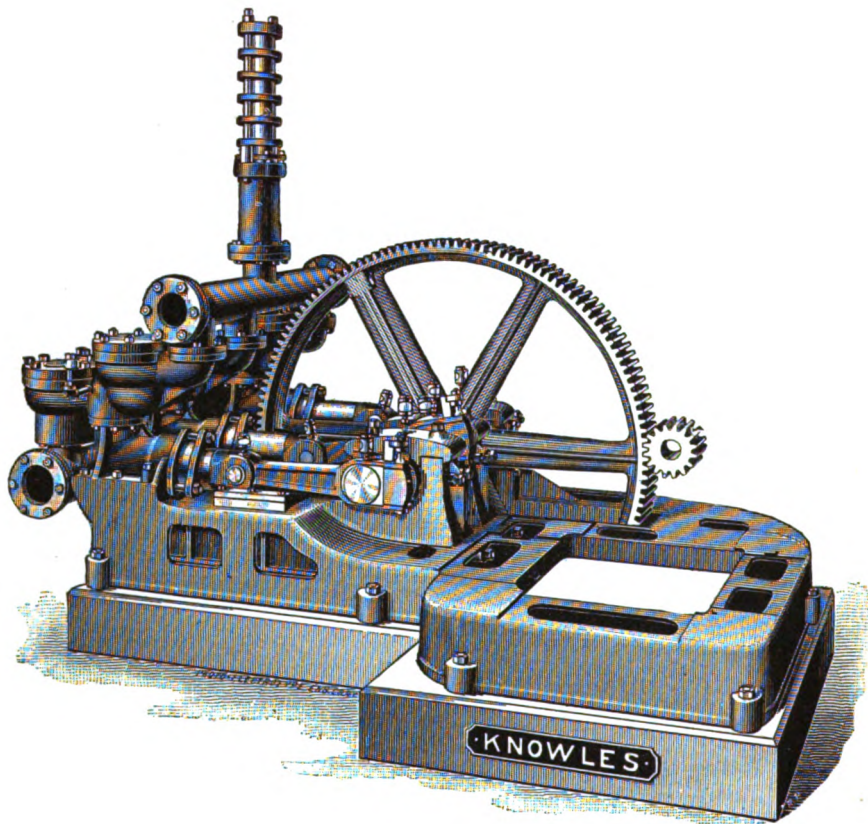


Plate 1104.

The above cut shows our Improved Horizontal Triplex Pump, with single-acting plungers, complete with extended bed plate for operation by an electric motor. This design is specially intended for mining work and general service in which pressures of from 200 to 600 pounds are necessary, and is provided with "pot" valves of the latest pattern. Power is transmitted from the motor to the plunger shaft by a single cut gear and pinion, thus reducing the working friction to a minimum, and making an extremely compact piece of apparatus. As in our vertical triplex pumps, the supply and discharge pipes may be located on either side. A special form of relief plunger is used instead of the usual form of air chamber.

Diameter of Cylinder	Stroke	Suction	Discharge	Rev. per Minute	Gallons per Revolution	Gallons per Minute	Maximum Lift in Feet	Ratio of Gearing	Weight Ready for Motor	H. P. of Motor	Weight Complete	Height Over All	Width Over All	Depth Over All	Price
3	6	3	2	74	.55	40	1250	8.78	lbs. 7100	20	9735	ft. 6 in. 8	ft. 6 in. 7	ft. 8 in. 8	.....
4	6	4	3	74	.98	72	750	8.78	7100	20	9735	6 8	6 7	8 8	.....
4 3/4	6	5	4	74	1.38	103	500	8.78	7145	20	9780	6 8	6 7	8 8	.....
5	6	5	4	74	1.52	112	440	8.78	7260	20	9895	6 8	6 7	8 8	.....
5 1/2	8	5	4	58	2.47	143	750	9	14045	50	19945	8 1	7 11	11 2	.....
6	8	6	5	58	2.94	162	680	9	14500	50	20400	8 1	7 11	11 2	.....
6 1/2	8	6	5	58	3.45	200	550	9	14845	50	20745	8 1	7 11	11 2	.....
7	8	6	5	58	4.0	232	500	9	15150	50	51050	8 1	7 11	11 2	.....

KNOWLES' IMPROVED GEARED ELECTRIC HORIZONTAL THREE-THROW PLUNGER PUMP.

FOR MINE USE, ETC.

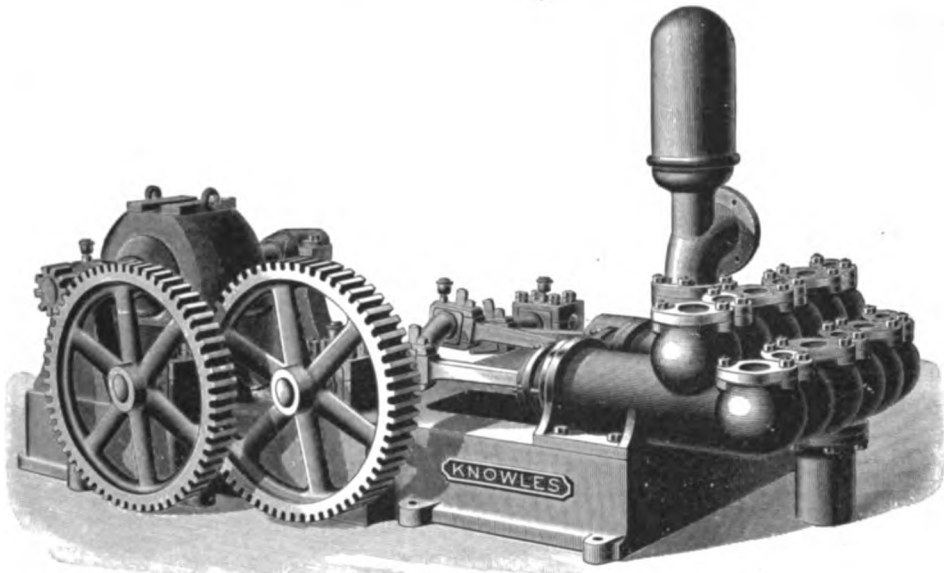


Plate 1105.

Prices on application. Send full particulars of work pumps will be required to perform.

KNOWLES' IMPROVED GEARED DUPLEX PLUNGER MINING PUMP.

Capacity, 500 Gallons per Minute; 500 Feet High.

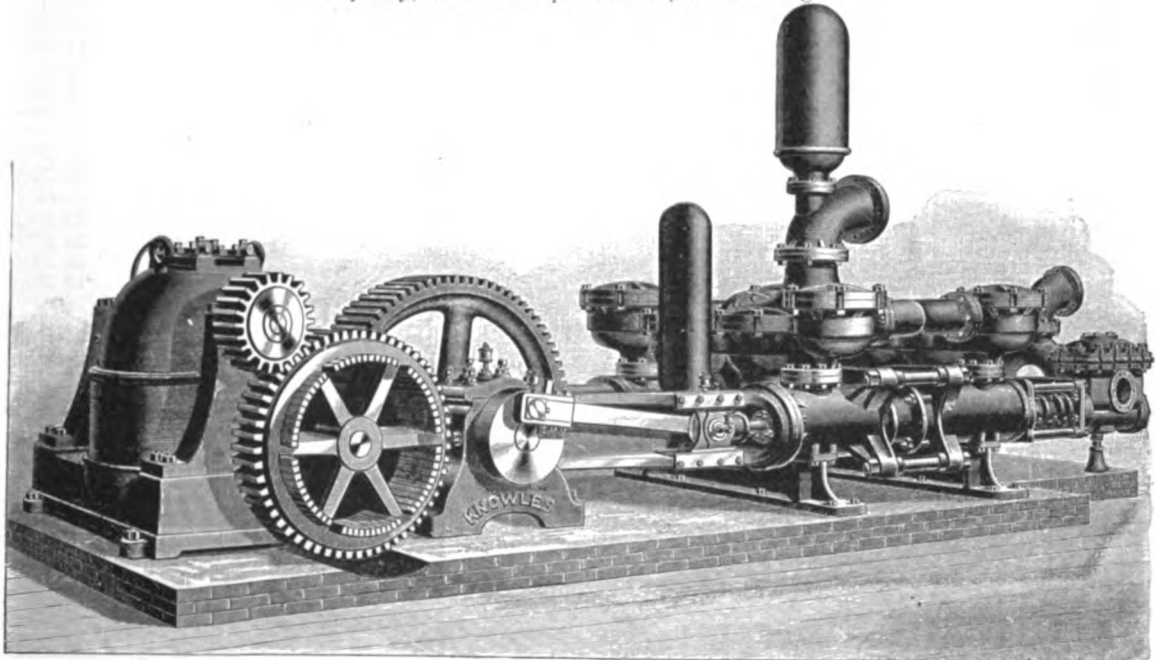


Plate 1106.

Electric Pumps built expressly for the work they are to do.

PUMP CYLINDERS.



Plate 1107.



Plate 1108.

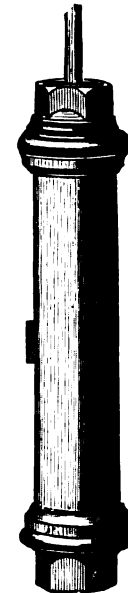


Plate 1109.

Size.	All Iron.	Brass Lined.		Brass Body, Iron Attach- ments.	Brass Body, Iron Attach- ments and Fol- lower, Brass Cage and Valve.	Brass Body, Iron Attach- ments and all Brass Plunger.	All Brass.
		Iron Plunger.	Brass Plunger.				
2 x 10	\$ 3 75	\$ 6 75	\$ 7 50	\$ 7 50	.....	.....	\$ 8 25
2 1/4 x 10	4 00	7 25	8 00	7 75	.....	.....	8 50
2 1/2 x 10	4 35	7 75	8 25	8 00	.....	.....	8 75
2 3/4 x 10	4 70	8 25	8 75	8 50	.....	.....	9 25
3 x 10	5 00	8 75	9 25	9 00	.....	.....	10 00
3 1/4 x 10	5 30	9 25	10 00	9 75	.....	.....	10 75
3 1/2 x 10	5 60	9 75	10 75	10 50	.....	.....	12 00
4 x 10	6 50	10 50	12 00	14 00	.....	.....	16 00
2 x 12	5 50	7 50	8 50	.....	\$ 8 00	\$ 8 50	9 00
2 1/4 x 12	5 75	8 00	9 00	.....	8 25	8 75	9 25
2 1/2 x 12	6 00	8 50	9 50	.....	8 50	9 00	9 50
2 3/4 x 12	6 50	9 00	10 00	.....	9 00	9 50	10 00
3 x 12	7 00	9 50	10 50	.....	9 50	10 25	11 00
3 1/4 x 12	7 50	10 00	11 25	.....	10 25	11 00	11 75
3 1/2 x 12	8 00	10 50	12 00	.....	11 25	12 75	13 50
4 x 12	9 25	12 50	15 00	.....	15 00	17 00	18 50
2 x 14	6 00	8 25	9 25	.....	8 50	9 75	11 25
2 1/4 x 14	6 25	8 75	9 75	.....	9 00	10 25	11 75
2 1/2 x 14	6 50	9 25	10 50	.....	9 25	10 50	12 00
2 3/4 x 14	7 00	9 75	11 00	.....	9 75	11 25	13 00
3 x 14	7 50	10 25	11 50	.....	10 25	11 75	13 50
3 1/4 x 14	8 00	10 75	12 50	.....	11 00	12 75	14 50
3 1/2 x 14	8 50	11 25	13 25	.....	12 25	14 75	16 25
4 x 14	10 00	14 00	16 50	.....	15 75	19 00	21 50
4 1/2 x 14	12 50	17 00	20 00	.....	18 00	23 00	28 00
5 x 14	14 25	21 00	25 00	.....	20 50	26 50	30 50
6 x 14	.....	.....	.....	.....	24 00	34 00	40 00
1 3/4 x 16	6 00	.....	.....	.....	9 00	10 50	12 00
2 x 16	6 00	9 00	10 00	.....	9 00	10 50	12 00
2 1/4 x 16	6 50	9 50	10 75	.....	9 75	11 25	12 75
2 1/2 x 16	7 00	10 00	11 50	.....	10 25	11 75	13 25
2 3/4 x 16	7 50	10 50	12 00	.....	10 75	12 25	13 75
3 x 16	8 00	11 00	12 75	.....	11 25	12 75	14 75
3 1/4 x 16	8 50	11 50	13 75	.....	12 00	14 00	16 00
3 1/2 x 16	9 00	12 00	14 50	.....	13 50	16 00	18 50
4 x 16	10 50	15 75	19 00	.....	17 50	20 50	24 00
4 1/2 x 16	13 00	18 75	24 50	.....	21 00	26 50	30 50
5 x 16	15 50	23 50	30 00	.....	24 00	31 00	36 00
6 x 16	22 00	29 50	38 00	.....	30 00	42 00	49 00

FOOT VALVE WITH
STRAINER.

Plate 1110.

GLOBE FOOT VALVE
WITH STRAINER.

Plate 1111.

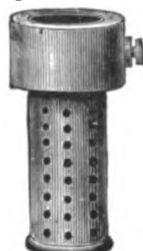
SET-SCREW
STRAINER.

Plate 1112.

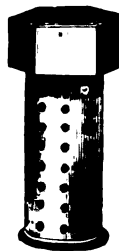
THREADED
STRAINER.

Plate 1113.

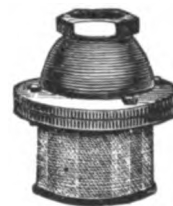
GAUZE COVERED
FOOT VALVE.

Plate 1114.

GLOBE STRAINER.
Galvanized. For Suction
Hose

Plate 1115.

Size, inches	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Foot Valves, Plate 1110 or 1111, each	\$2 00	2 25	2 50	3 00	3 50	4 50	6 00	8 00	10 00
Set-screw Strainers, Plate 1112, each	40	50	60	80	1 00	2 00	.....	.....	.....
Set-screw Strainers, wired covered, each	75	85	1 00	1 10	1 50	3 50	.....	.....	.....
Threaded Strainers, Plate 1113, each	45	55	70	90	1 10	2 20	.....	.....	.....
Globe Strainer, Plate 1115, galvanized, each	1 00	1 50	1 75	2 00	.....	.....	.....	.....	.....
Gauze covered Foot Valve, Plate 1114	1 50	1 75	2 00	.....	.....	.....	.....	.....	.....

EARTH AUGERS.



Plate 1116.



Plate 1117.



Plate 1118.



Plate 1119.



Plate 1120.

Size of hole Augers will make, inches	2	2 1/4	3	3 1/2	4	4 1/2	5	6
Chisel Bit Auger, Plate 1116, for clay and hard pan	\$6 00	6 50	7 00	8 50	10 00	15 00	20 00	25 00
Pod Auger, Plate 1117, for boring and removing core	6 00	6 50	7 00	8 50	10 00	15 00	20 00	25 00
Ribbon Auger, Plate 1118, for general boring	6 00	6 50	7 00	8 50	10 00	15 00	20 00	25 00
Twist Auger, Plate 1119, for general boring	6 00	6 50	7 00	8 50	10 00	15 00	20 00	25 00
Spiral Auger, Plate 1120, for loosening and removing stones	6 00	6 50	7 00	8 50	10 00	15 00	20 00	25 00

RUMSEY WELL POINTS.

COVERED BY LETTERS PATENT.



Plate 1121.



Plate 1122.



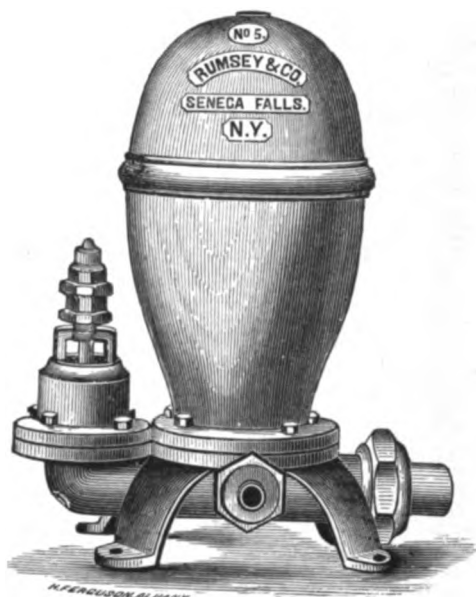
Plate 1123.

Size in Diam., Inches	Length of Point, Inches	Length of Jacket, Inches	Number of Holes	Number of Gauze 60 Price per Dozen	Number of Gauze 70 Price per Dozen	Number of Gauze 80 Price per Dozen	Number of Gauze 90 Price per Dozen	Number of Gauze 100 Price per Dozen
1	24	18	72	\$ 33 00	\$ 40 00	\$ 46 00	\$ 52 00	\$ 62 00
1¼	24	18	100	36 00	44 00	52 00	60 00	80 00
1¼	30	24	130	46 00	55 00	64 00	75 00	100 00
1¼	36	30	165	56 00	66 00	76 00	90 00	120 00
1½	24	18	120	48 00	57 00	65 00	78 00	94 00
1½	30	24	162	60 00	70 00	80 00	96 00	118 00
1½	36	30	198	72 00	84 00	95 00	114 00	142 00
1½	42	36	240	84 00	97 00	110 00	132 00	166 00
2	30	24	208	90 00	101 00	112 00	132 00	160 00
2	36	30	264	105 00	118 00	130 00	154 00	190 00
2	42	36	288	120 00	134 00	148 00	176 00	220 00
2	48	42	336	135 00	151 00	166 00	198 00	250 00
2	60	54	432	165 00	184 00	202 00	242 00	310 00
2½	36	30	300	180 00	205 00	230 00	260 00	300 00
2½	48	42	360	230 00	265 00	300 00	340 00	400 00
2½	60	54	420	280 00	325 00	370 00	420 00	500 00
2½	72	66	480	330 00	385 00	440 00	500 00	600 00
3	36	30	300	240 00	275 00	310 00	340 00	410 00
3	48	42	420	300 00	345 00	390 00	430 00	520 00
3	60	54	540	360 00	415 00	470 00	520 00	630 00
3	72	66	660	420 00	485 00	550 00	610 00	740 00
4	48	36	260	480 00	520 00	560 00	600 00	700 00
4	72	60	600	630 00	695 00	760 00	840 00	1000 00
4	96	84	840	780 00	870 00	960 00	1080 00	1300 00

Plate 1121 is made of galvanized gas pipe covered with brass wire cloth, protected by a perforated brass shield.

Plate 1122 is the well-known washer point with brass wire cloth fitted in counter-sunk holes, fastened by washers.

Plate 1123 is our patch point, made with the gauze soldered over the perforation.

RUMSEY HYDRAULIC RAM.**Plate 1124.**

N. B.—The length of the Drive or Supply Pipe should not be less than three-quarters of the height to which the water is to be raised, or five times the height of supply; it may, however, be longer.

	Minimum quantity of Water required to operate Ram. Gallons per minute.	Length of Drive Pipe. Feet.	Caliber of Pipes.		Price
			Drive. Inches.	Discharge. Inches.	
No. 2	2		$\frac{3}{4}$	$\frac{3}{8}$	\$ 9 00
No. 3	4	Five to six	1	$\frac{3}{8}$	11 00
No. 4	8	times the	$1\frac{1}{2}$	$\frac{1}{2}$	14 00
No. 5	14	height of the	2	1	22 00
No. 6	25	supply.	$2\frac{1}{2}$	$1\frac{1}{4}$	40 00
No. 7	60		4	2	75 00
No. 8	120		6	$2\frac{1}{2}$	125 00

We solicit correspondence with parties desiring to use Hydraulic Rams. We are always ready to advise customers as to the best sizes for their own cases, and to give them the benefit of our large experience in these matters.

GAS COMPANIES' AND PLUMBERS' BRASS DRIP PUMPS.

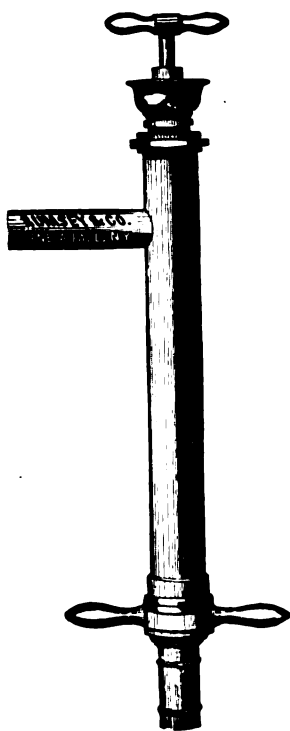


Plate 1125.



Plate 1126.

Plate 1125 shows our new Gas Drip Pump, admirably designed and constructed for all its purposes. The Cylinder is 20 inch stroke, and made of brass with cap and stuffing-box of same metal, and a solid brass rod. The spout passage, being nearly as large as the cylinder, insures a free delivery of the drip. It works perfectly, excelling other drip pumps in several features, and needs only to be seen to secure a ready approval.

Plate 1126 shows a Brass Cylinder Suction Pump, also used for extracting the water from gas drips. It is substantially built, and gas companies, plumbers, and others will find it excellently adapted for their uses. We make it with 20 inch stroke.

	Fitted for Pipes, Inches	Diam. of Cyl., Inches	Stroke, Inches	Capacity per Stroke, Gallons	Price
Plate 1125	$\frac{3}{4}$ or 1	2	20	$\frac{1}{4}$	\$15 00
Plate 1126	$\frac{3}{4}$ or 1	2	20	$\frac{1}{4}$	12 00

Plate 1125 is all Brass.

Plate 1126 has Brass Cylinder.

HAND ROTARY PUMP.

WITH IMPROVED BARREL ATTACHMENT, OR HOLDER.

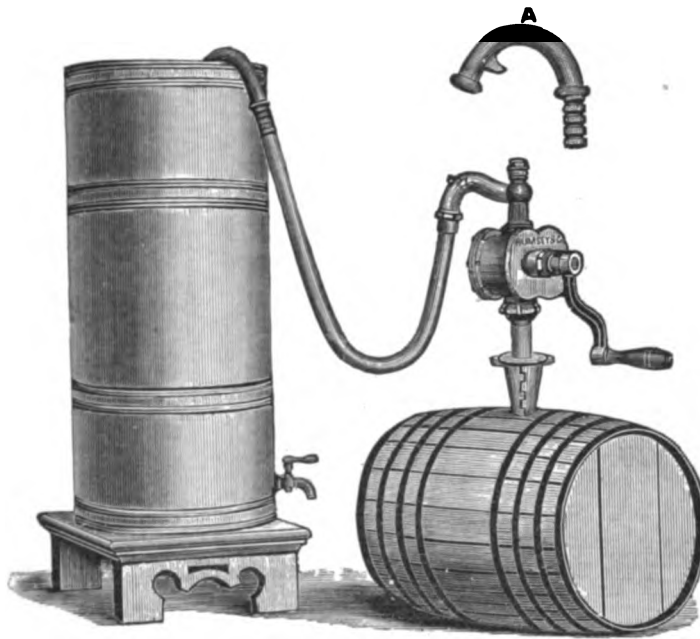


Plate 1127.

This cut indicates in a clear manner one of the uses of our celebrated Hand Rotary Force Pumps. It is shown arranged with our improvement for holding the suction pipe of the pump rigid in the bung of a barrel, and also exhibits the pieces which accompany each pump. The holder is a conical sleeve made in halves, designed to clasp the pipe firmly in any sized bung from $1\frac{1}{2}$ to 4 inches in diameter, and without injuring the shape of the bung in the least degree. The discharge pipe is so formed that it retains its hold on the tank without other fastening. A suction pipe three feet in length goes with each pump, and is notched at the bottom so that the entire contents of the barrel can be discharged. With this complete and perfect apparatus liquids of any consistency can be pumped from barrels and other casks to any desired distance or height. It is a most useful appendage to all oil stores and refineries, drug houses, paint manufactories, etc.

	Suction and Discharge, Inches	Size Hose, Inches	At 100 Rev. per minute Capacity, Inches		Iron, Price	Bronze, Price
No. 1	1	$\frac{7}{8}$	13	.....	\$17 00	\$39 00
No. 2	1	1	20	.....	20 00	44 00

Above prices include Suction Pipe, Hose Coupling, Hook and Holder, Discharge Spout, and Bung Attachment. Brass or copper Suction Pipes furnished at the extra cost of metal only.

HAND ROTARY FORCE PUMP.

WITH BALANCE WHEEL.

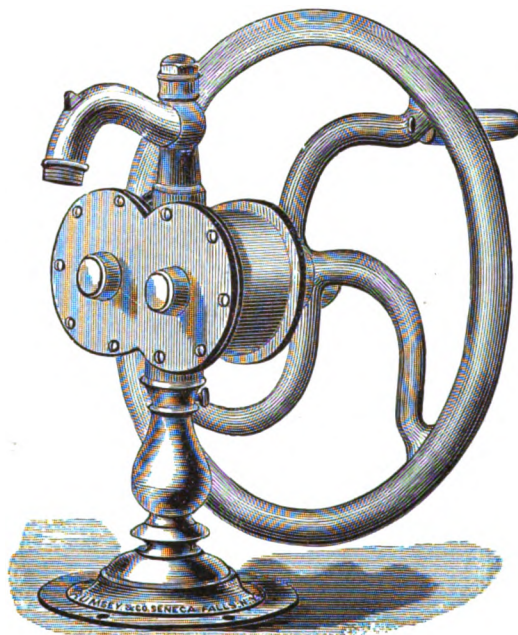


Plate 1128.

Plate 1128 represents all our medium sizes of Rotary Cistern Pumps. They throw a large and constant stream with an easy and almost noiseless operation, and without the aid of an air-chamber. They are made anti-freezing, being furnished with brass plugs for drawing off the water when not in use during cold weather. With only average care given them they are more durable than the ordinary force pump. Used extensively in cisterns and wells, pumping hot or cold liquids, filling boilers, as tank pumps for supplying tenders for threshing machines, in pumping wines, liquors and chemicals, testing pipes and hose, as a garden engine and for fire protection, for use in breweries, distilleries and oil refineries—in fact, they can be applied successfully to any and all uses for which a first-class Force Pump is adaptable. The cams are of the most approved pattern, and fitted and ground accurately together.

	Fitted for Pipe, Inches	Capacity per Rev., Gallons		Iron, Price	Bronze,* Price
No. 1	1¼	1	.....	\$19 00	\$40 00
No. 2	1½	1½	.....	21 00	45 00
No. 4	2	1¾	.....	35 00	64 00

* Bronze Pumps are all bronze except fly wheel and base.

Hose and pipe suitable for Nos. 1 and 2, extra, \$3.00.

Hose and pipe suitable for No. 4, extra, \$5.00.

The spouts of all sizes of Plate 1128 are screwed for attaching hose.

Hose and play pipes furnished when ordered.

HAND ROTARY PUMP.**WITH SIDE SUCTION FOR HOSE.****Plate 1129.**

Plate 1129 is adapted for pumping all kinds of liquids, but is especially intended for the use of wine and cider producers.

The Side Suction is a very convenient arrangement, as the hose may be readily removed from one position to another.

The Bronze Pumps are best suited for pumping wine, cider and other liquids which would corrode iron.

	Fitted for Pipe, Inches	Size Hose, Inches	Capacity per Rev., Gallons		Iron, Price	*Bronze, Price
No. 1	1 $\frac{1}{4}$	1	$\frac{1}{8}$	.....	\$19 00	\$40 00
No. 2	1 $\frac{1}{2}$	1	$\frac{1}{5}$	.....	21 00	45 00
No. 4	2	1 $\frac{1}{4}$	$\frac{1}{3}$	.....	35 00	64 00

*The Bronze Pumps are all bronze except Base and Fly-wheel.

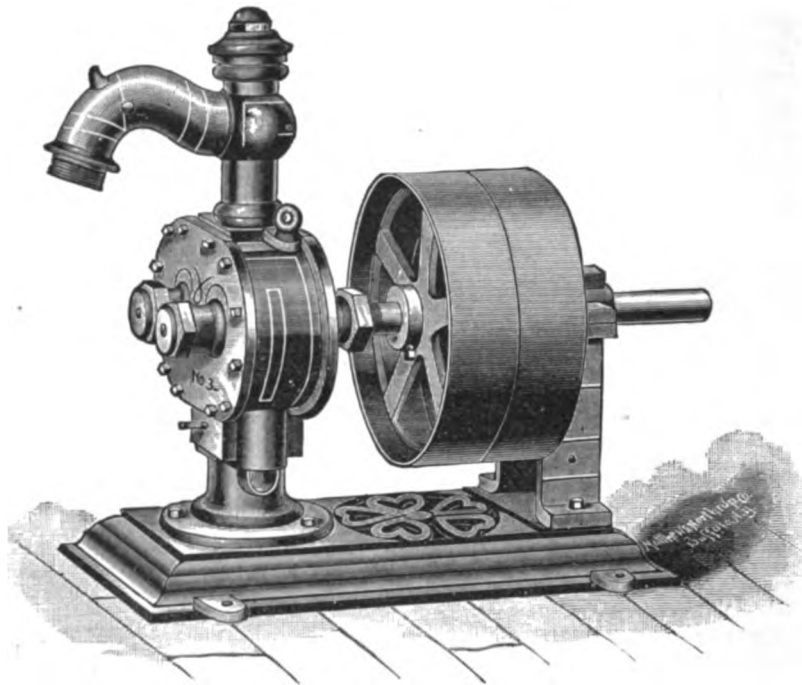
POWER ROTARY FORCE PUMP.**Plate 1130.**

Plate 1130 represents our Rotary Pump on Standard with outside bearing and pulley for power. It is admirably adapted for high speed gas or kerosene engines, and electric motors. The height of bearings admits the use of a relatively large pulley to compensate for the high speed of the motor.

This pump is always fitted for wrought iron pipe.

Drip Cocks are supplied to prevent freezing.

	Size Pipe, Inches	Capacity per Rev. Gallons		Iron, Price	Bronze, Price
No. 1	1¼	⅛	.....	\$25 00	\$47 00
No. 2	1½	⅓	.....	28 00	52 00
No. 4	2	⅓	.....	45 00	75 00

POWER ROTARY FORCE PUMP.**MOUNTED ON IRON FRAME.****Plate 1131.**

The above cut shows one of our celebrated Rotary Power Pumps, without outside gearing, arranged with tight and loose pulleys, outside Babbitt bearing, etc. This is a cheap and very useful pump, well adapted to establishments requiring but a small stream pumped and want it rapid and constant. It is very compact and durable, and in contrast to its size and price will be found to possess a large capacity and ability to perform a great deal of hard work. It is well adapted for a small fire pump, and will throw water from 125 to 150 feet horizontally. For oil refineries, breweries, distilleries, etc., it is admirably suited for various purposes, and also in extensive use in cotton and woolen factories for pumping drinking water into upper rooms. These Pumps are constructed in the same perfect manner as those of a larger class, the only difference being the absence of the outside gearing. The driving shaft is made of ample length to permit a balance wheel with handle to be placed on outside of the bearing, readily enabling it to be worked by hand in an emergency. The spout is screwed for hose on the outer end, and for wrought-iron pipe where it connects to the Pump. The spout can be removed and connection made with iron pipe wherever it is necessary to force the water upward to any height above the Pump.

These Pumps can be run up to 200 revolutions per minute without injury, although we recommend a lower rate of speed.

	Fitted for Pipe, Inches	Capacity per Rev., Gallons	Size Pulleys, Inches	Iron, Price	Bronze, Price
No. 1	1 $\frac{1}{4}$	$\frac{1}{8}$	8 x 2 $\frac{1}{2}$	\$26 00	\$45 00
No. 2	1 $\frac{1}{2}$	$\frac{1}{4}$	8 x 2 $\frac{1}{2}$	31 00	55 00
No. 4	2	$\frac{1}{3}$	12 x 3 $\frac{1}{4}$	48 00	75 00
No. 5	2 $\frac{1}{2}$	$\frac{1}{2}$	15 x 3 $\frac{1}{4}$	54 00	90 00

Balance Wheels for above Pumps, \$1, \$2 and \$3, according to size.

POWER ROTARY FORCE PUMP.

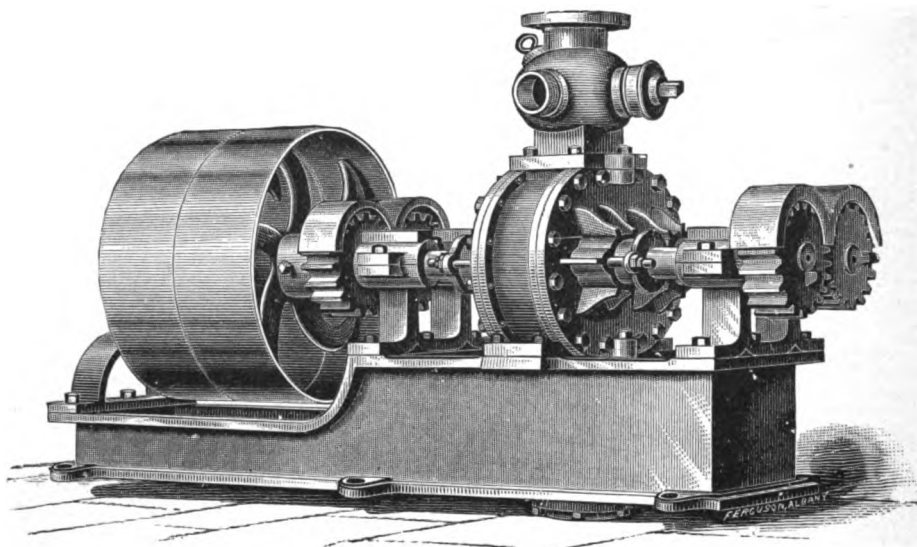


Plate 1132.

The cut shows Plate 1132 complete in all sizes. Furnished with either tight and loose pulleys or gears for driving as most convenient to the purchaser.

A capacious Vacuum Chamber, into which the Suction Pipe screws, is also cast in the frame.

	Capacity per Revolution, Gallons	Diam. Suc. and Dis., Inches	Revolution per Minute	Size of Pulleys	Iron, Price	Bronze, Price
No. 1	$\frac{1}{3}$	2	200	14 x 4 $\frac{1}{2}$	\$100 00	\$160 00
No. 2	$\frac{2}{3}$	2 $\frac{1}{2}$	175	16 x 5 $\frac{1}{2}$	115 00	180 00
No. 3	1 $\frac{1}{4}$	3	150	18 x 6 $\frac{1}{2}$	160 00	260 00
No. 4	1 $\frac{3}{4}$	4	125	20 x 8 $\frac{1}{2}$	240 00	.....
No. 5	2 $\frac{1}{4}$	5	100	Gear d	300 00	.....

These Pumps can be run at a much higher speed, if necessary. After using, turn the cams backward two or three times to empty the Pump of water and prevent freezing; then pour in some good oil and turn the cams forward two or three times. Any of our Power Rotary Pumps can be used for fire service.

VAN WIE CENTRIFUGAL PUMPS. IMPROVED HORIZONTAL PUMP.

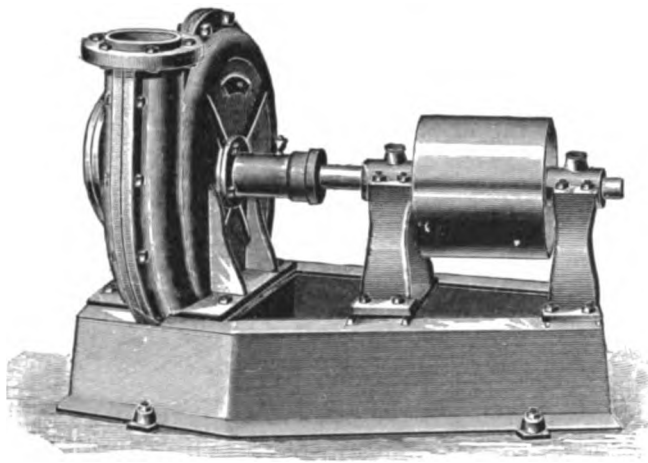


Plate 1133.

Plate 1134 shows our Improved Horizontal Suction Pump, which is the same as the Plain Horizontal, with the addition of a Primer for priming by hand. This style is used where Pump sets above water. Our new Hand Primer is so arranged that there is but one Valve; this Valve can be reached in a moment by loosening one cap screw and removing yoke and plate. The Primer is the simplest, most efficient and easiest working in use, and is perfect. We make power Primers for larger Pumps.

We would not advise the use of a Primer with larger than No. 6 Pumps, but would recommend, for larger sizes, an Ejector and a Foot Valve.

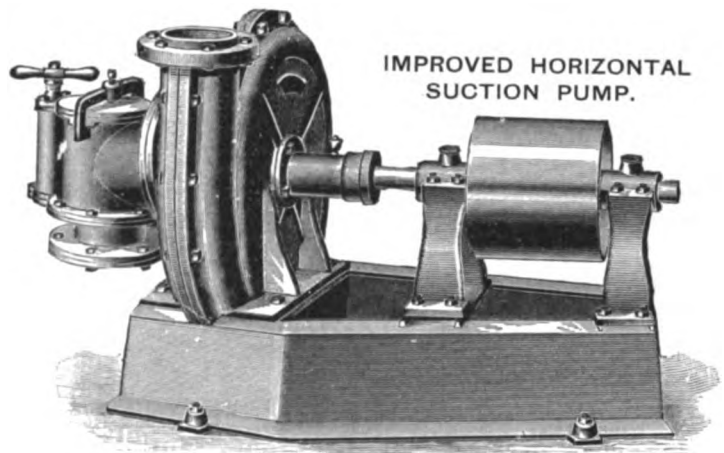


Plate 1134.

DIMENSIONS, CAPACITIES AND PRICES.

Diam. of Discharge	Diam. of Suction	Capacity per Minute, Gallons.	Plate 1133, Plain, Price	Plate 1134, Suction, Price	H. P. per Foot Lift	Weight in Pounds, About	Diam. and Face of Driving Pulley
1½ in.	2 in.	150	\$ 35 00	\$ 45 00	.063	120	6 x 6
1¾ in.	2 in.	200	50 00	60 00	.085	175	6 x 6
2 in.	2½ in.	300	70 00	85 00	.126	225	7 x 8
2½ in.	3 in.	450	80 00	95 00	.190	290	7 x 8
3 in.	4 in.	650	95 00	110 00	.270	325	7 x 8
3½ in.	5 in.	1,000	110 00	135 00	.425	400	10 x 10
4 in.	5 in.	1,250	130 00	155 00	.504	450	10 x 10
5 in.	6 in.	1,850	165 00	195 00	.765	510	10 x 10
6 in.	8 in.	2,600	200 00	240 00	1.10	900	12 x 12
8 in.	10 in.	4,750	310 00	375 00	1.90	1,440	15 x 12
10 in.	12 in.	7,500	395 00	470 00	3.14	1,680	18 x 14
12 in.	14 in.	10,000	500 00	600 00	4.	1,820	20 x 14
15 in.	18 in.	16,000	710 00	850 00	6.75	3,800	30 x 18
18 in.	22 in.	22,000	.....	.....	9.65	6,500	40 x 24

REVOLUTIONS PER MINUTE.

6 ft.	8 ft.	10 ft.	12 ft.	16 ft.	20 ft.	25 ft.	30 ft.	35 ft.	40 ft.	50 ft.
500	650	750	850	1,950	1,100	1,200	1,500	1,800	2,000	2,200
425	590	680	725	825	900	975	1,050	1,120	1,170	1,284
400	450	525	575	650	720	780	852	908	960	1,058
375	425	475	525	600	675	720	800	875	940	1,010
350	400	425	450	500	550	650	775	850	910	990
325	375	410	425	475	525	625	700	825	900	950
275	300	350	400	450	500	600	675	800	890	920
260	290	330	340	430	480	560	650	750	860	900
200	220	240	300	360	420	490	540	580	610	650
185	200	225	250	310	360	390	425	450	475	500
166	188	220	245	285	320	360	386	414	436	470
160	180	210	220	246	268	285	300	320	335	365
100	124	148	172	208	220	236	252	264	277	300
80	100	110	120	148	155	168	176	204	220	254

Plate 1133 represents our Improved Plain Horizontal Pump, in which the Shaft runs horizontally with bearing at either end of pulley. This must be set so that water will flow into it, unless a Foot Valve is used in bottom of induction pipe, in which case it may be set to not exceed twenty-eight feet above the water. In construction the Pumps are all alike, being cast in two halves or shells with flanges, which are bolted together. The piston revolves between these two shells secured to Shaft. This Pump with foot valve at bottom of suction pipe is chiefly used for irrigating and draining. Pumps built to run Right or Left handed as desired. In ordering, state whether Pump should run Right or Left handed. Pump shown in cut runs Right handed.

IMPROVED HORIZONTAL SUCTION PUMP.

VAN WIE CENTRIFUGAL SAND PUMP.

SAND PUMP.

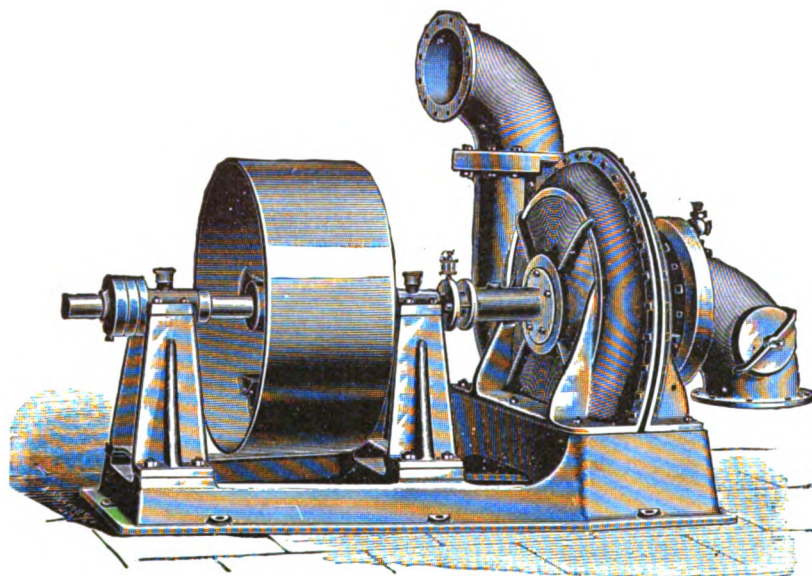


Plate 1135.

SAND PUMP PISTON.

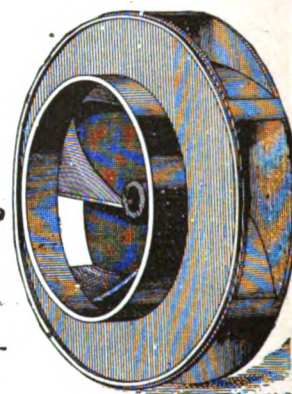


Plate 1136.

NEW STYLE SAND PUMP OR HYDRAULIC DREDGING PUMP.

It has been repeatedly demonstrated that for dredging sand, silt, mud, clay, marl, or for pumping coal, grain, etc., from sunken vessels, etc., a Centrifugal Pump is by far more economical and efficient than any other device for dredging, inasmuch as by a single operation the material can be taken from its bed and discharged at any reasonable distance.

Our new style Sand Pump, as shown in cut above, is provided with our new Sand Pump Piston (see cut), also with chambered brass bushing in bearing next to Pump on pulley side.

These Pumps are made extra heavy, and are fitted in the most workmanlike manner with steel shafts, and especially designed for the work of handling sand, mud, gravel, phosphate, etc.; in fact, any substance that can be pumped.

OPERATION.—The most convenient way of operating these Pumps, is to place the whole Pumping Plant on a flat boat or scow placing the Pump across ship on the stern of boat, using an elbow, and then from ten to twenty feet of flexible rubber suction hose, extending back horizontally, then use an elbow to which is attached, bending downward, spiral riveted pipe and foot valve using a derrick and either power or steam hoist with which to handle the suction hose. By this means a channel can be cut from twenty to fifty feet in width and at almost any depth desired, and an even, level bottom maintained, or the sides can be round or inclined as desired.

We will be pleased at any time to give estimates upon power, cost of outfit, and description of plant required, upon receipt of inquiry, giving us a description of the material to be handled, the depth of water, the distance to be carried, and the height of bank or shores. The cost of sand pumping or dredging outfit is from 10 to 20 per cent of the cost of the old-fashioned dipper, scoop or clam shell dredge. The cost of running the Centrifugal Dredging Plant would be less than the repair account of the ordinary dipper dredge. Another and very important feature of the Centrifugal Pump Dredge is that the channel can be deepened, and at the same operation and time the material can be deposited evenly over the surface of low lands deepening the channel and filling up land at the same operation.

DIMENSIONS AND CAPACITIES.

Diameter of Discharge, Inches	Diameter of Suction, Inches	Cu. Yds. Sand per Hour, Maximum	H. P. for 15 Ft. Lift	Size of Pulleys	Speed for 15 Ft. Lift	Weight in Lbs.
No. 2	3	20	5	10 x 10	700	350
No. 3	4	25	8	10 x 10	600	400
No. 4	5	50	10	12 x 12	550	450
No. 5	6	60	18	12 x 12	500	650
No. 6	8	80	25	12 x 14	450	1200
No. 8	10	150	45	20 x 12	375	1800
No. 10	12	270	65	30 x 12	300	2500
No. 12	14	350	100	40 x 16	250	3600

Larger Pumps according to specifications

PRICE LIST.

Size and Discharge	Price of Pump	Sand Pump Foot Valve	Prices of Ejectors	Flap Valves, Inches	Flap Valves, Each	Swivel Flanges for Elbows, Inches	Swivel Flanges for Elbows, Each	Flanged Elbow, Size, Inches	Flanged Elbow Price Each
No. 2	\$ 90 00	\$10 00	\$ 8 00	2	\$ 8 00	2	\$1 50	2	\$ 1 25
No. 3	120 00	15 00	10 00	3	9 00	3	2 00	3	2 00
No. 4	150 00	15 00	10 00	4	13 00	4	3 50	4	3 50
No. 5	175 00	18 00	15 00	5	19 00	5	4 00	5	4 00
No. 6	200 00	25 00	20 00	6	22 00	6	4 50	6	4 50
No. 8	310 00	35 00	25 00	8	28 00	8	5 00	8	7 00
No. 10	395 00	45 00	35 00	10	36 00	10	6 00	10	10 00
No. 12	500 00	55 00	45 00	12	44 00	12	7 50	12	12 00

Increasing speed in harder soil or clay will increase quantity of material delivered. One foot fall to the 100 feet is sufficient for the discharge pipe to carry off the quantities of materials in above table. To prime these Pumps where it is not convenient to connect with Steam Pump, we furnish ejectors as per above list.

VAN WIE VERTICAL CENTRIFUGAL PUMP.

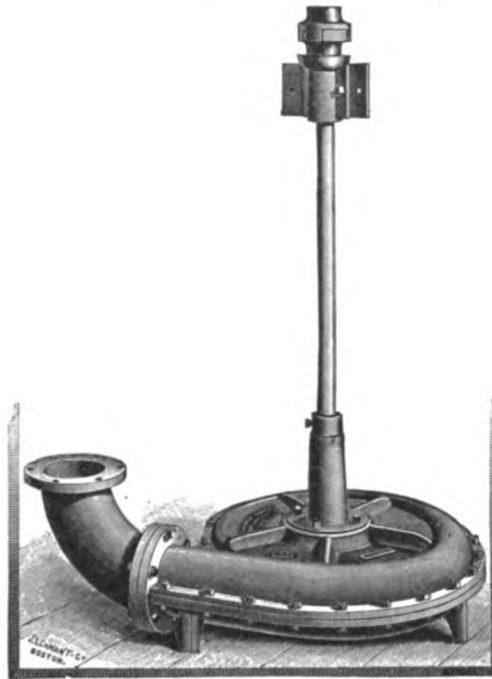


Plate 1137.

The cut on this page represents our Vertical Pump, which is intended to be submerged in the liquid to be raised. It is made of iron, brass or bronze, is very simple in construction, and is easily placed in position. When made of brass it is used by and is a great favorite with tanners, as it will pass bark, pieces of hide and skin, hair, etc., without clogging.

This style of Pump is used almost exclusively by contractors, and is a very satisfactory Pump for dry-dock use. As the pump is constantly immersed it is primed and ready to start at all times. For floor space required and length of shaft furnished with each Pump, see table below.

We can furnish extra shafting, bearings and pipe for any size promptly. In placing Pump see that shaft is maintained in a vertical position; that legs rest on an even foundation, and shaft turns free and easy. Be sure everything is in line, and securely fastened.

In ordering extra shafting, give distance from foundation on which Pump is to be placed to where the center of pulley above same should be. Pumps are to be run with the arrow, as shown on the shell of all Pumps of our make.

PRICE LIST IRON AND BRASS VERTICAL CENTRIFUGAL PUMPS.

Size number and Diameter of Discharge.	Capacity in Gallons per minute.	Horse Power required for each foot of lift.	Diameter and face of pulley in inches.	Floor space required in inches about.	Distance from bottom of Pump to center of coupling.	Coupling is bored for connecting shaft.	Shipping weight — pounds about.	Price Iron Pump, with elbow, one pair couplings, pulley and one bearing.	Price of Brass Pump with elbow and one pair couplings.
					Ft. In.	Inches		\$	\$
1 1/2	150	.075	6 x 6	17 x 21	2 1/2	1	110	30 00	55 00
1 3/4	200	.100	6 x 6	21 x 28	3 0	1	140	40 00	80 00
2	300	.125	7 x 8	25 x 29	3 4	1 1/8	180	60 00	110 00
2 1/2	450	.200	7 x 8	27 x 30	3 4	1 1/8	200	70 00	135 00
3	650	.300	7 x 8	27 x 32	3 4	1 1/8	215	75 00	150 00
4	1,250	.525	10 x 10	30 x 39	4 0	1 3/8	350	110 00	240 00
5	1,850	.800	10 x 10	34 x 45	4 7	1 1/2	550	140 00	315 00
6	2,600	1.25	12 x 12	38 x 58	4 7	1 1/2	665	170 00	360 00
8	4,750	2.	15 x 12	45 x 48	5 5	2	1,175	265 00	.....
10	7,500	3.25	18 x 14	52 x 68	5 5	2	1,800	330 00	.....
12	10,000	5.	20 x 14	64 x 82	6 0	2 1/8	2,500	420 00	.....
15	16,000	8.	30 x 18	77 x 102	6 6	2 3/8	4,600	600 00	.....
18	22,000	12.	40 x 24	98 x 126	7 0	3 1/4	6,800	950 00	.....

HYDRAULIC PRESSURE PUMP.

FOR TESTING STEAM BOILERS, PIPES, ETC.

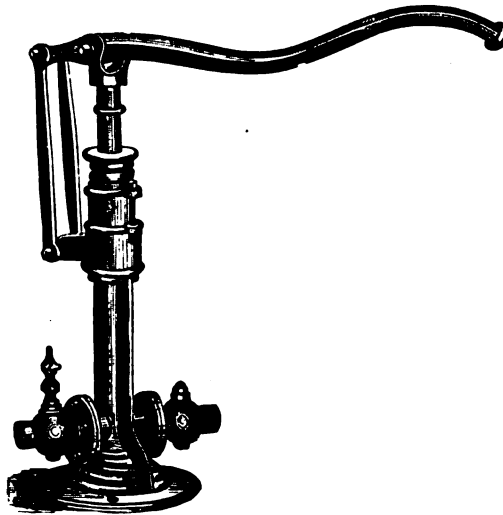


Plate 1138.

Plate 1138 represents our Hydraulic Pressure Testing Pump. It is made exceedingly strong and compact, and designed especially for testing boilers, pipes, casks, etc. The piston being small, it is not calculated for a lift pump, but within its proper sphere no better pump is made, as a pressure of 1,000 pounds to the square inch can be generated with it by the power of one man. It should be placed very near the water. A little suction, however, will not detract from its efficiency; on the contrary, we advise the use of one or two feet of suction pipe.

	Diameter Suction, Inches	Diameter Discharge, Inches	Diameter Plunger, Inches	Stroke, Inches		Iron, Price	Brass, Price
No. 1	1	$\frac{3}{8}$	$1\frac{1}{4}$	4	.....	\$25 00	\$45 00

NEW HAND BOILER FEED PUMP.

ON BASE.

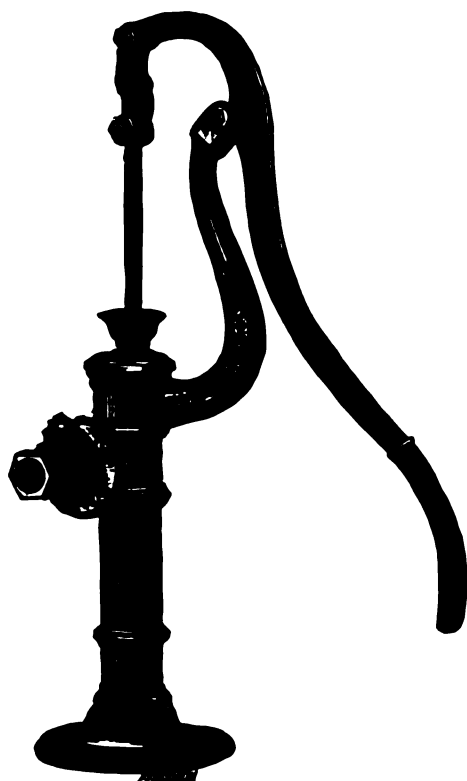


Plate 1139.

ON PLANK.

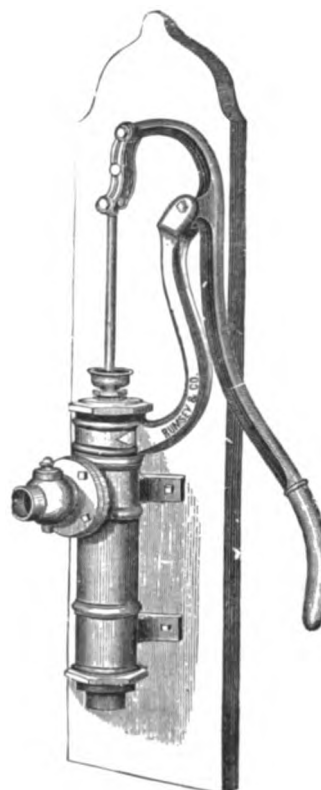


Plate 1140.

The above Plates show a very serviceable Pump for feeding small boilers by hand-power, and well adapted for use in mint distilleries, cheese factories, etc. It is also of ample capacity for feeding larger boilers when used for heating buildings by steam, especially if a steam trap is employed for saving the condensed steam and returning it to the boiler. It is constructed on true scientific principles, with economy of cost, and is fitted with metallic valves for pumping hot as well as cold water. The rod and plunger are of brass. We make this Pump either with brackets for bolting to plank or partition, or on base for fastening to the platform of well or reservoir.

	Size Pipe, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Rev., Gallons		Iron. Price	Brass Cylinder, Price
No. 0	1	2	5	$\frac{1}{3}$	.....	\$12 00	\$18 00
No. 00	$1\frac{1}{4}$	$2\frac{1}{2}$	5	$\frac{1}{2}$	.....	14 00	22 00

THE RUMSEY JET PUMP.

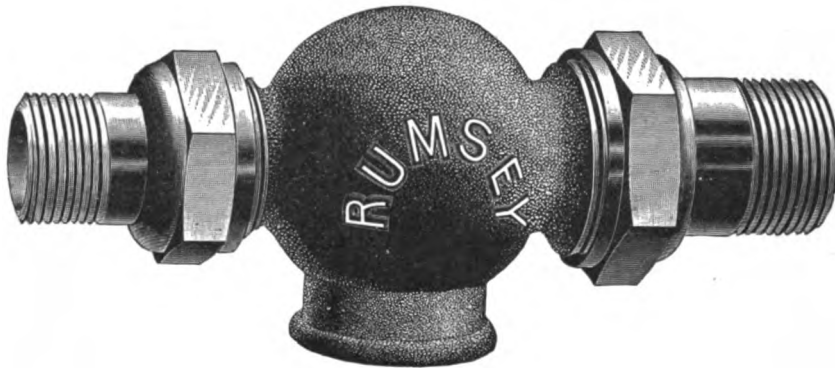


Plate 1141.

All working parts interchangeable.

Starts at 10 pounds pressure.

Will lift water 25 feet at 50 pounds pressure.

Will elevate water 1 foot for every pound of steam pressure.

Steam and Suction Jets are made of Bronze.

Size	Steam Connection	Delivery and Suction	Capacity per hour at 65 pounds pressure	Price	Strain- ers
No. 1	Brass $\frac{3}{8}$	$\frac{1}{2}$	240	\$ 8 00	\$1 00
No. 2	Brass $\frac{1}{2}$	$\frac{3}{4}$	500	10 00	1 10
No. 3	Brass $\frac{3}{4}$	1	840	15 00	1 35
No. 4	Brass 1	$1\frac{1}{4}$	1300	20 00	1 65
No. 5	Brass 1	$1\frac{1}{2}$	2000	25 00	2 00
No. 6	Brass $1\frac{1}{4}$	2	3500	35 00	2 50
No. 7	Iron Body $1\frac{1}{2}$	$2\frac{1}{2}$	5000	40 00	.....
No. 8	Iron Body 2	3	8000	50 00	.....
No. 9	Iron Body 2	4	10000	60 00	.....

BLAKESLEE'S STEAM JET PUMP.

DESIGNED FOR SUPPLYING WATER TANKS AT MILLS, FACTORIES, AND FOR PUMPING WATER OR OTHER LIQUIDS AT MINES, STONE QUARRIES, TANNERIES, OIL WORKS, ETC.

DIRECTIONS FOR PUTTING UP STEAM JET PUMPS.



Plate 1142.

Place the Pump so it will have the least suction circumstances and convenience will admit of, but never over 14 feet perpendicular.

Attach the Steam Pipe to Boiler, and extend it to the point where the Pump is to set.

Put a Stop-Cock in the Steam Pipe, at a convenient point, to start and stop the Pump.

Screw the Pump on to the Steam Pipe, and then attach the Suction Pipe and Discharge Pipe with the Swivel Nuts.

The Pump will work in any position, but the Pipes should be as straight as possible. The Discharge Pipe must not have an elbow in it near the Pump, if the Suction Pipe be long.

Be sure that the Suction Pipe, and all joints about the Pump, are perfectly tight, and that the Gum Gaskets are in their proper places—one under the Suction Pipe Swivel and one on the Brass Combining Pipe.

As Stop Valves are always liable to get worn and leak, it will always be best to put a drip-hole and plug in the Pipe, just beyond the Stop Valve, toward the Pump, which should be taken out in cold weather after using the Pump.

The Suction Pipe should have a Strainer on the end, with holes a little smaller than the Combining Pipe, but give plenty of water opening to the Strainer, so as not to cut off the supply of water. The Discharge Pipe must be put up so that the water will all run out when steam is shut off.

DIRECTIONS FOR OPERATING.

Turn on the steam slowly until the suction is formed, which will be indicated by a peculiar singing noise in the Pump; then turn on steam enough to drive the water to point of discharge.

If the Pump fails to start, and the Suction Pipe gets hot, it is caused by one of three things: 1. Leaks in the Suction Pipe. 2. Obstructions in the Suction Pipe, or in the Pump. 3. Too high suction.

Twenty-five pounds of steam ought always to form the suction, and higher steam must be carried according to the height of discharge, at about the rate of 1 pound to each foot

The Brass Set Screw is to draw off the condensed steam in cold weather.

Size of Pump	Suction Pipe	Discharge Pipe	Steam Pipe	Steam Opening	Capacity Per Minute	Price
$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	$\frac{1}{2}$ inch	$\frac{3}{8}$ inch	$\frac{1}{8}$	8 gallons	\$ 8 00
1 inch	1 inch	$\frac{3}{4}$ inch	$\frac{1}{2}$ inch	$\frac{1}{8}$	15 gallons	10 00
$1\frac{1}{4}$ inch	$1\frac{1}{4}$ inch	1 inch	$\frac{1}{2}$ inch	$\frac{1}{8}$	20 gallons	12 00
$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	$1\frac{1}{4}$ inch	$\frac{3}{4}$ inch	$\frac{1}{8}$	30 gallons	14 00
2 inch	2 inch	$1\frac{1}{2}$ inch	$\frac{3}{4}$ inch	$\frac{1}{8}$	40 gallons	16 00
$2\frac{1}{2}$ inch	$2\frac{1}{2}$ inch	2 inch	1 inch	$\frac{1}{8}$	50 gallons	20 00
3 inch	3 inch	$2\frac{1}{2}$ inch	1 inch	$\frac{1}{8}$	60 gallons	24 00

Brass Pumps will be furnished at an additional cost of from 15 to 20 per cent.

PARTS OF BLAKESLEE'S JET PUMP.

Size	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Nuts, each	\$0 50	50	50	75	75	1 00	1 50	1 50
Malleable Nipples, each	25	25	25	35	35	60	75	1 00
Combining Pipes (loose tube), each . . . . .	...	75	75	75	1 00	1 00	1 50	1 50
Steam Tubes (tight tube), each . . . . .	...	25	50	50	60	60	75	75

N. B.—Size of Nipples determined by inside diameter.

Size of Nut determined by size Nipple it will take.

VAN DUZEN L JET PUMP.

L JET PUMP.

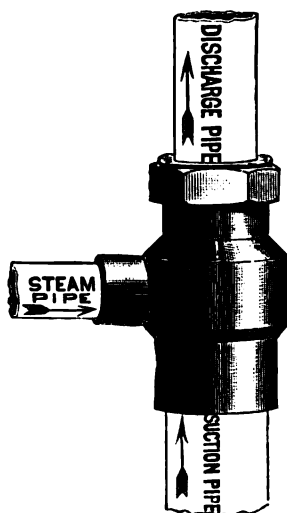


Plate 1143.

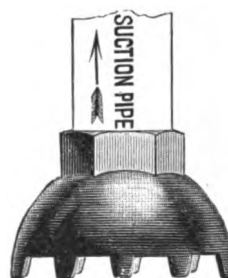
FOOT STRAINER FOR USE WITH
L JET PUMPS.

Plate 1144.

The Pump as listed is made entirely of brass.

The Pump as shown and listed is complete and ready for pipe connections. The size of pipes given in the tables are those fitting the Pump.

Threads are cut to standard gas pipe sizes. Gas pipe and fittings are generally used; but hose and hose connections may be used with equal advantage if advisable or necessary.

The Foot Strainer is of cast iron with brass strainer. Pumps or Foot Strainers may be made of any metal or composition to order.

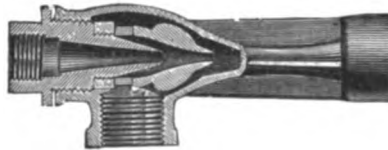
Orders for L Pumps with Foot Strainer must be so stated, as it will be sent with the Pump only when so ordered.

The capacities given in the table are the nominal capacities.

VAN DUZEN'S PATENT STEAM JET PUMP AND FOOT STRAINERS FOR USE WITH SAME.

N. B.—Pump made entirely of Gun Metal.

Size of Pump	Capacity per Hour	Price of Pump	Price of Foot Strainer	Suction Pipe	Discharge Pipe	Steam Pipe	Steam Jet Diameter
No. 1 L	300 gals.	\$ 7 00	\$0 75	$\frac{3}{4}$ inch	$\frac{1}{2}$ inch	$\frac{3}{8}$ inch	$\frac{11}{16}$ inch
No. 2 L	500 gals.	8 50	1 00	1 inch	$\frac{3}{4}$ inch	$\frac{3}{8}$ inch	$\frac{13}{16}$ inch
No. 3 L	750 gals.	10 50	1 25	$1\frac{1}{4}$ inch	1 inch	$\frac{1}{2}$ inch	$\frac{29}{32}$ inch
No. 4 L	1,200 gals.	13 00	1 50	$1\frac{1}{2}$ inch	$1\frac{1}{4}$ inch	$\frac{1}{2}$ inch	$\frac{25}{16}$ inch
No. 5 L	1,700 gals.	16 00	2 00	2 inch	$1\frac{1}{2}$ inch	$\frac{3}{4}$ inch	$\frac{39}{32}$ inch
No. 6 L	3,000 gals.	20 00	2 50	$2\frac{1}{2}$ inch	2 inch	$\frac{3}{4}$ inch	$\frac{49}{32}$ inch
No. 7 L	5,000 gals.	26 00	3 00	3 inch	$2\frac{1}{2}$ inch	1 inch	$\frac{59}{32}$ inch
No. 8 L	7,500 gals.	36 00	4 00	4 inch	3 inch	1 inch	$\frac{69}{32}$ inch
No. 9 L	10,000 gals.	50 00	5 00	5 inch	4 inch	$1\frac{1}{4}$ inch	$\frac{89}{32}$ inch
No. 10 L	14,000 gals.	75 00	6 00	6 inch	5 inch	$1\frac{1}{2}$ inch	1 inch

COLL'S DEFIANCE PUMP.**ABSOLUTELY NON-FREEZING.****Plate 1145.**

Will elevate water 75 feet with 50 pounds of steam.

Gas Pipe, size	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6 in.
Delivery per hour in gallons, at 50 pounds steam pressure	280	350	850	1,400	2,300	2,800	3,500	6,000	13,000	16,000
Diameter of Steam Pipe . . .	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Diameter of Delivery Pipe . .	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6 in.
Brass, each	\$12 00	16 00	25 00	35 00	50 00	65 00	85 00	100 00	150 00	200 00
Strainers for same, each . . .	1 00	1 00	1 00	1 50	1 50	2 00	2 50	4 00	5 00	6 00

SHERIFF'S PUMP.**Plate 1146.**

For elevations not exceeding 35 feet.

Gas Pipe, size	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6 in.
Delivery per hour in gallons, at 40 pounds steam pressure	800	1,050	1,600	3,000	4,500	7,000	8,800	10,000	12,000
Diameter of Steam Pipe . . .	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2 in.
Diameter of Delivery Pipe . .	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	$4\frac{1}{2}$	6 in.
Brass, each	\$10 00	15 00	20 00	24 00	28 00	32 00	52 00	72 00	96 00
Strainers for same, each . . .	1 00	1 00	1 50	1 50	2 00	2 50	4 00	5 00	6 00

COLL'S EJECTOR.**NON-FREEZING.****Plate 1147.**

For elevations not exceeding 35 feet.

Gas Pipe, size	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6 in.
Delivery per hour in gallons, at 40 pounds steam pressure	890	1,250	1,960	3,200	5,125	8,050	9,800	13,000	16,000
Diameter of Steam Pipe . . .	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2 in.
Diameter of Delivery Pipe . .	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	$4\frac{1}{2}$	6 in.
Iron, each	\$10 00	15 00	20 00	24 00	28 00	32 00	52 00	72 00	96 00
Strainers for same, each . . .	1 00	1 00	1 50	1 50	2 00	2 50	4 00	5 00	6 00

FRIEDMANN'S EJECTORS OR WATER ELEVATORS.

FOR RAISING WATER AND CONVEYING LIQUIDS.

EXTERIOR VIEW.

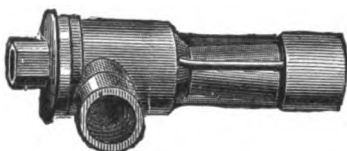


Plate 1148.

SECTIONAL VIEW.

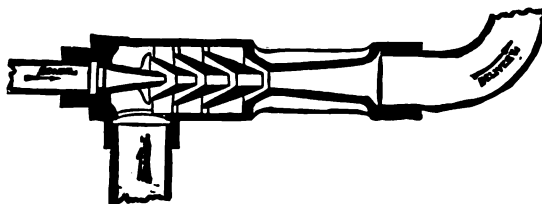


Plate 1149.

These Ejectors are the most effective agents, within recognized limits, that can be employed for raising water and conveying liquids—in many cases the only ones that can properly do the work. They are a marvel of simplicity in construction. They require only a small quantity of steam to keep them going, and in this respect have a great advantage over siphons and other contrivances, which use a great deal and in many cases have been dispensed with altogether on that account. It will take the liquid at a temperature of 175 degrees.

They are applicable in a great variety of forms for raising water and fluids from tanks, wells, ponds, mines, quarries, holds of vessels, docks, gas works, wheel pits, and other receptacles too numerous to mention.

As a Bilge Pump, these Ejectors have no equal. We have supplied the U. S. Navy with a number of them.

These Ejectors are very compact in shape and do not occupy much space, and hence may be placed, at little expense, near the work to be done, which would be impossible in many instances with steam pumps or other pumping appliances. They have another advantage in being portable, and capable of being moved readily, with little trouble, from place to place, which is a very desirable feature where the duty they are required to do is not of a stationary character.

TO OPERATE EJECTORS.

To start—Open the valve or cock in steam pipe slightly for a few seconds, to let the condensed steam blow through, then open full.

To stop—Close the steam valve.

N. B.—Steam to operate the Ejector should be taken from the highest part of the boiler; especially in case of long distances is dry steam necessary.

The Ejectors will force water or liquids as follows:

At 14 pounds steam pressure	20 feet in height.
At 28 pounds steam pressure	40 feet in height.
At 42 pounds steam pressure	60 feet in height.
At 56 pounds steam pressure	75 feet in height.
At 70 pounds steam pressure	90 feet in height.

CAPACITY AND PRICE LIST OF EJECTORS.

Number	000	00	0	1	2	3	4	5	6
Delivery per hour in gals. at 45 lbs. steam pressure	250	500	900	1200	2000	3000	5000	8000	10000
Diameter of Steam Pipe in inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Diameter of Delivery Pipe in inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4
Diameter of Suction Pipe in inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$	3	4
Boiler Capacity, Horse Power	3 to 4	3 to 4	3 to 4	5 to 6	7 to 8	10 to 15	25	35	45
Each	\$8 00	14 00	20 00	30 00	50 00	75 00	100 00	125 00	150 00

At 80 pounds steam pressure the Ejector will throw 50 per cent more water.

THE PENBERTHY AUTOMATIC INJECTOR.

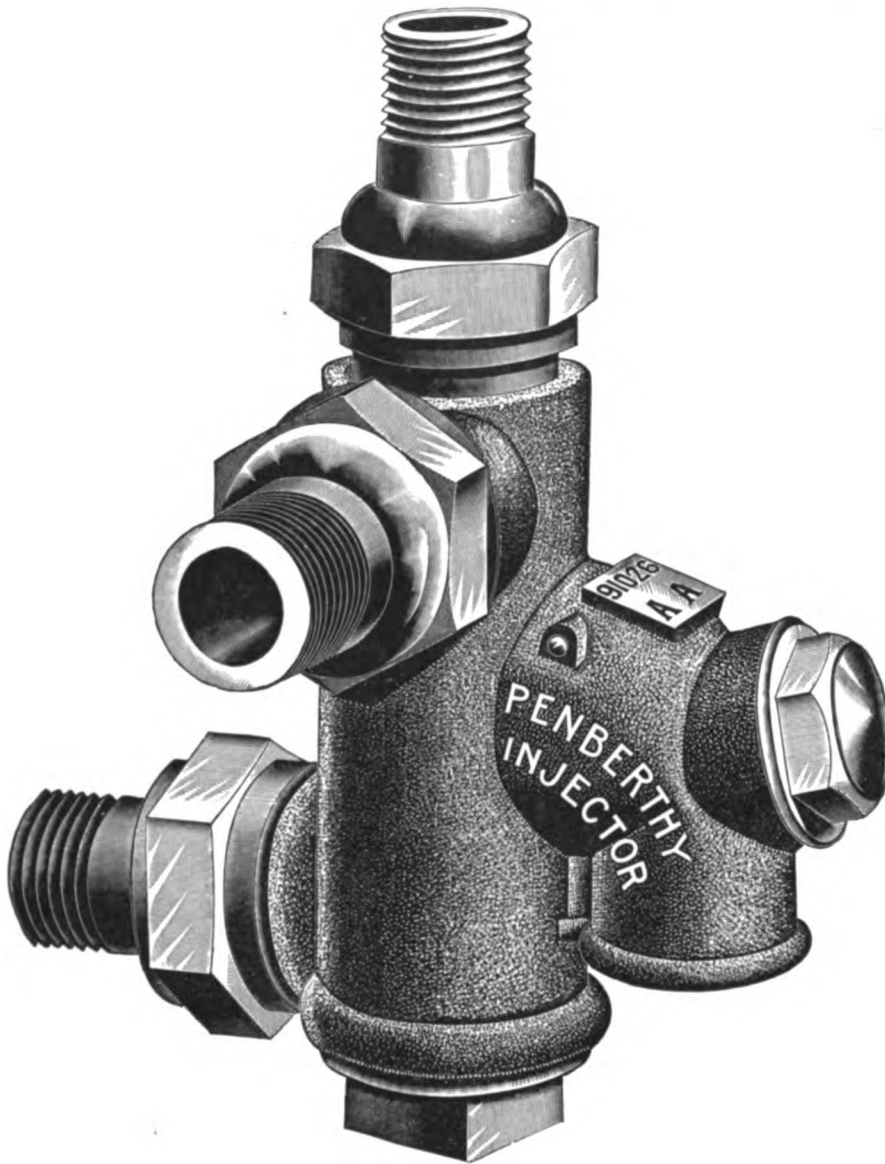


Plate 1150.

CAPACITY, HORSE POWER, ETC.

Size	Price	Pipe Connections			Capacity per Hour 1 to 6 ft. lift, 45 to 75 lbs. Pres.		Horse Power
		Steam	Suction	Delivery	Maximum	Minimum	
OO	\$ 16 00	$\frac{3}{8}$ inch	$\frac{3}{8}$ inch	$\frac{3}{8}$ inch	80 gals.	55 gals.	4 to 8
A	18 00	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch	120 gals.	70 gals.	8 to 10
AA	20 00	$\frac{1}{2}$ inch	$\frac{1}{2}$ inch	$\frac{3}{4}$ inch	165 gals.	90 gals.	10 to 15
B	25 00	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	250 gals.	185 gals.	15 to 25
BB	30 00	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	340 gals.	165 gals.	25 to 35
O	40 00	1 inch	1 inch	1 inch	475 gals.	300 gals.	35 to 60
OC	45 00	1 inch	1 inch	1 inch	575 gals.	350 gals.	50 to 60
D	55 00	$1\frac{1}{4}$ inch	$1\frac{1}{4}$ inch	$1\frac{1}{4}$ inch	750 gals.	400 gals.	60 to 95
DD	60 00	$1\frac{1}{4}$ inch	$1\frac{1}{4}$ inch	$1\frac{1}{4}$ inch	920 gals.	500 gals.	95 to 120
E	75 00	$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	1300 gals.	700 gals.	120 to 165
EE	90 00	$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	$1\frac{1}{2}$ inch	1740 gals.	900 gals.	165 to 230
F	110 00	2 inch	2 inch	2 inch	2270 gals.	1100 gals.	230 to 290
FF	125 00	2 inch	2 inch	2 inch	2800 gals.	1400 gals.	290 to 365

As will be seen from the above the Penberthy popular sizes OO to DD will deliver a greater quantity of water than any other make at same or greater price, and at the same time, the capacity can be cut down about one-half by simply throttling the water supply valve. In doing this and using one-half the water and same amount of steam, you deliver water at nearly boiling point. We therefore advise for best results and a saving of fuel to buy a larger Injector than actually needed, and cut down capacity to amount required. This remarkable grading of water is not accomplished to any extent in any other Injector, and consequently the delivered water cannot be nearly as hot, which means an increased fuel account.

UNITED STATES AUTOMATIC INJECTOR.

FOR STATIONARY, MARINE, PORTABLE AND TRACTION ENGINES.

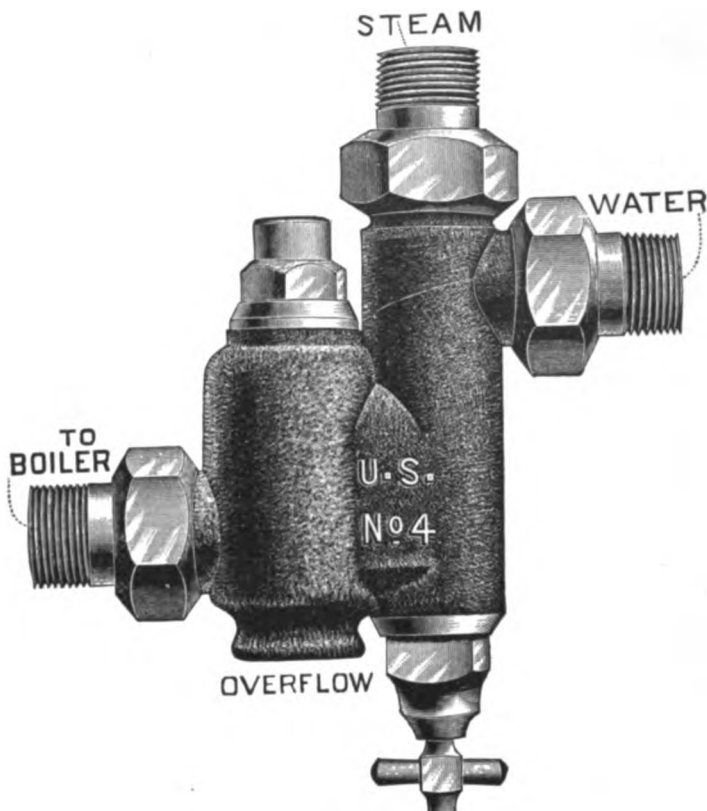


Plate 1152.

The most reliable and economical of all Boiler Feeders.

UNITED STATES INJECTOR.

	All Pipe Connections	*Capacity Gallons per Hour.		Horse Power		Price
		Max.	Min.			
Size 00	$\frac{1}{4}$ inch	36	15	1 to 4	.....	\$ 13 00
Size 0	$\frac{3}{8}$ inch	65	28	3 to 8	.....	14 00
Size 1	$\frac{3}{8}$ inch	90	40	6 to 10	.....	16 00
Size 2	$\frac{1}{2}$ inch	125	60	8 to 15	.....	18 00
Size 3	$\frac{1}{2}$ inch	170	75	15 to 20	.....	20 00
Size 4	$\frac{3}{4}$ inch	250	125	20 to 30	.....	25 00
Size 5	$\frac{3}{4}$ inch	340	140	30 to 40	.....	30 00
Size 6	1 inch	475	250	40 to 60	.....	40 00
Size 7	1 inch	575	300	60 to 70	.....	45 00
Size 8	$1\frac{1}{4}$ inch	750	350	70 to 85	.....	55 00
Size 9	$1\frac{1}{4}$ inch	920	450	85 to 120	.....	60 00
Size 10	$1\frac{1}{2}$ inch	1350	675	120 to 165	.....	75 00
Size 11	$1\frac{1}{2}$ inch	1750	850	165 to 230	.....	90 00
Size 12	2 inch	2275	1000	230 to 295	.....	110 00
Size 13	2 inch	2820	1300	295 to 375	.....	125 00
Size 14	2 inch	3400	1700	375 to 460	.....	150 00
Size 15	$2\frac{1}{2}$ inch	3650	1800	460 to 500	.....	175 00
Size 16	$2\frac{1}{2}$ inch	4000	1950	500 to 600	.....	200 00

*The capacity is tested on a four-foot lift with steam at 80 pounds. In ordering, always bear in mind that longer lift decreases capacity.

Note that the United States has greater capacity, at maximum, than any other Injector of same price, and also that each size can be graded farther than any other.

For Repairs, see page 506.

SECTIONAL VIEW OF U. S. AUTOMATIC INJECTOR.

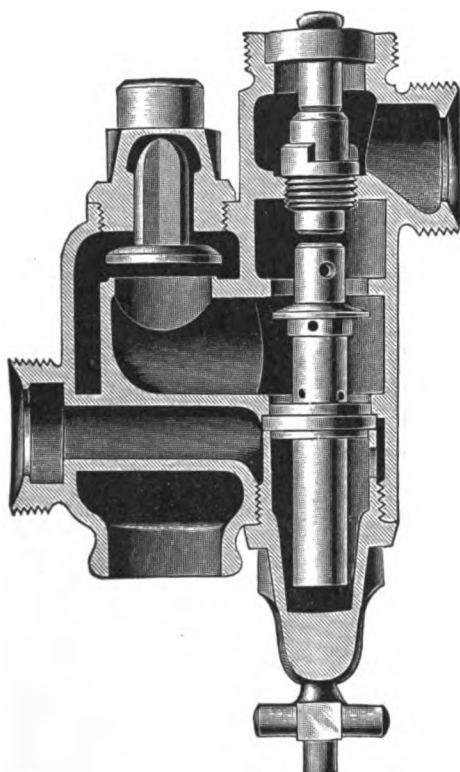


Plate 1153.

PARTS OF U. S. INJECTOR.

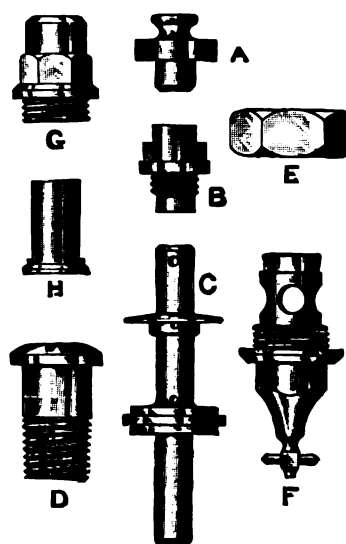


Plate 1154.

A Steam Jet. B Suction Jet. C Delivery Tube. D Tail Pipe. E Tail Pipe Nut. F Delivery Cap. G Overflow Valve Cap. H Overflow Valve.

When ordering repairs always give the size and shop number of the Injector, and specify the parts by the name here given for each part.

Name of Part	Size of Injector					
	000 to No. 3	4 and 5	6 and 7	8 and 9	10 and 11	12, 13 and 14
D Tail Pipe	\$0 30	\$0 35	\$0 40	\$0 50	\$0 75	\$1 00
E Tail Pipe Nut	30	40	50	65	85	1 20
A Steam Jet	80	1 00	1 15	1 35	1 60	2 00
B Suction Jet	50	75	1 25	1 50	1 75	2 00
C Delivery Tube	1 00	1 10	1 45	1 75	2 00	2 50
F Delivery Cap	1 00	1 10	1 45	1 75	2 00	2 50
G Overflow Valve Cap . . .	80	95	1 00	1 25	1 50	2 00
H Overflow Valve	80	95	1 00	1 25	1 50	2 00

THE HANCOCK STATIONARY INSPIRATOR.

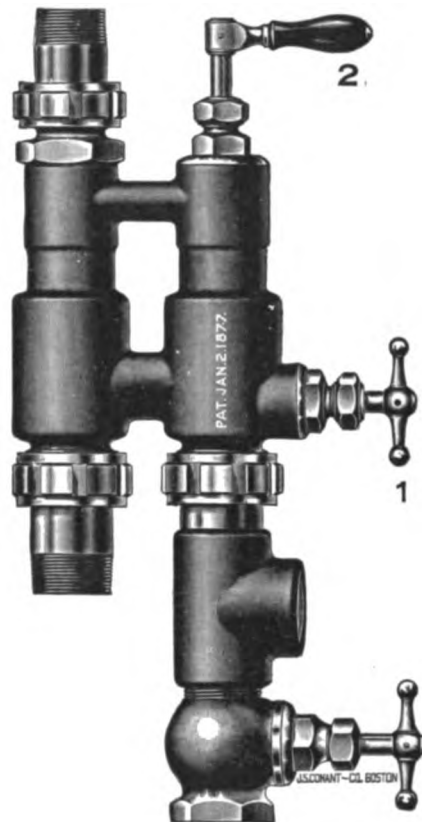


Plate 1155.

Inspirator	Size Connection		Galls. per hour, 60 lbs. press.	Price
	Suction and Feed Pipe	Steam Pipe		
No. 7½	¾	¾	60	\$16 00
No. 8¾	1½	¾	85	18 00
No. 10	1½	¾	120	20 00
No. 12½	¾	1½	220	25 00
No. 15	¾	1½	300	30 00
No. 17½	1	¾	420	40 00
No. 20	1	¾	540	45 00
No. 22½	1¼	1	720	55 00
No. 25	1¼	1	900	60 00
No. 30	1½	1¼	1,260	75 00
No. 35	1½	1¼	1,740	90 00
No. 40	2	1½	2,230	110 00
No. 45	2	1½	2,820	125 00
No. 50	2½	2	3,480	150 00
No. 55	2½	2	3,800	175 00

The best feeder known for Stationary, Marine and Locomotive Boilers; simple, reliable and always in order. Has no rival for pumping purposes; consumes less steam than any other boiler feeder known; requires no oiling. The Hancock Inspirator is the best appliance known for feeding all kinds of boilers, on account of its simplicity of operation, the great range of its duties and the fact that all the steam used in operating it is returned to the boiler, there being no loss excepting by radiation, from the pipes used in connecting. It differs materially in its construction from the class of boiler feeders known as Injectors, inasmuch as it has one set of tubes for lifting and another set of tubes for forcing water—a combination entirely new, reliable and efficient. There being no movable parts in its internal construction, it is not liable to get out of order; requires no oiling or adjusting to the various steam pressures or lifts, and is always ready to start at a moment's notice. Water can be delivered at a high or low temperature, as may be desired. No adjustment is required for varying steam pressures; all sizes will lift water 25 feet, working as well on a 25 feet lift as on a low lift. Each Inspirator is carefully tested before leaving the manufactory, and is guaranteed to perform all that is claimed, it being attached and operated according to the printed directions that accompany each machine.

THE MONITOR INJECTORS.

LIFTING AND NON-LIFTING, FOR PORTABLE, STATIONARY AND MARINE BOILERS.

CLASS O, NON-LIFTING.

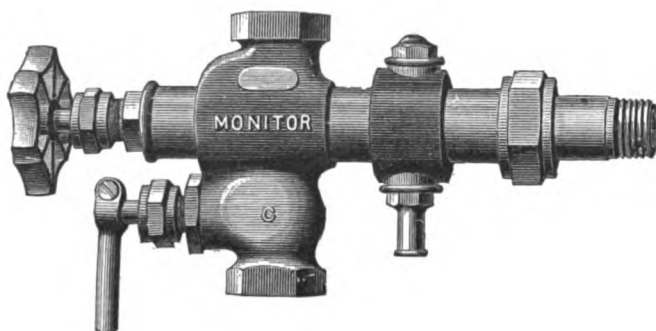


Plate 1156.

CLASS D, LIFTING.

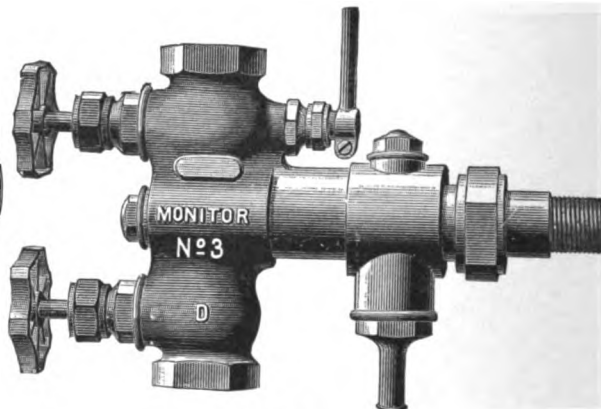


Plate 1157.

Size of Injector, Number	2	2½	3	4	5	6	7	8	9	10	12	14	16	18
Inside Diameter of Pipe	½	½	¾	1	1¼	1½	1½	1½	2	2	2½	2½	3	3 in.
Delivery pr. hour in galls., 120 lbs. press.	170	235	375	600	825	1175	1575	2025	2575	3150	4200	5925	7650	9350
Delivery pr. hour in galls., 60 lbs. press.	120	175	250	425	600	850	1125	1450	1850	2250	3000	4225	5450	6800
Class C, Non-Lifting, each	\$17	21	27	40	50	60	75	90	110	130	160	200	250	325
Class D, Lifting, each	19	24	32	45	55	65	80	100	120	140	180	225	275	350

FRIEDMANN'S INJECTORS.

FOR STATIONARY, PORTABLE, LOCOMOTIVE AND MARINE BOILERS.

CLASS D, LIFTING.

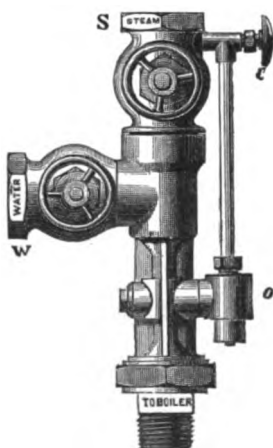


Plate 1158.

CLASS O, NON-LIFTING.

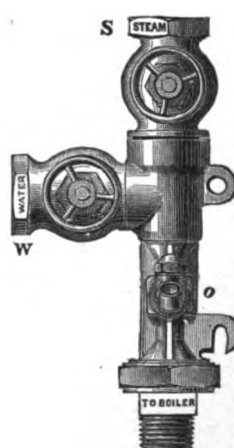


Plate 1159.

Size of Injector, Number	2	3	4	5	6	7	8	9	10	12	14	16	18	20
Minimum Inside Diameter of Pipe . .	½	¾	1	1¼	1½	1½	1½	2	2	2½	2½	3	3	3½ in.
Del. pr. hr. in galls., steam press. 120 lbs.	170	375	615	900	1230	1650	2130	2640	3240	4320	6100	8050	9850	12000
Del. pr. hr. in galls., steam press. 60 lbs.	135	285	480	690	960	1260	1590	1980	2465	3300	4650	6050	7550	9420
Del. pr. hr. in galls., steam press. 20 lbs.	90	195	315	450	570	840	1050	1310	1635	2350	3200	4180	5390	6530
Class C, Non-Lifting, each	\$17	27	40	50	60	75	90	110	130	160	200	250	325	400
Class D, Lifting, each	19	32	45	55	65	80	100	120	140	180	225	275	350	450

THE METROPOLITAN AUTOMATIC INJECTOR.

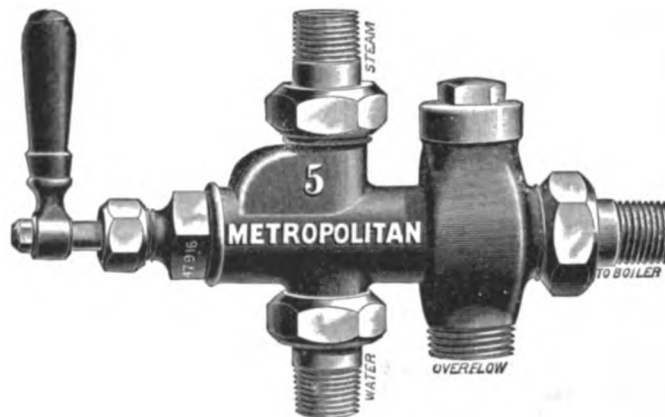


Plate 1160.

Size	Price	Size of Pipe Connection	Capacity per Hour	Horse Power
2	\$ 15 50	$\frac{3}{8}$	60 gals.	4 to 6
3	16 00	$\frac{3}{8}$	80 gals.	6 to 8
3 $\frac{1}{2}$	18 00	$\frac{1}{2}$	120 gals.	8 to 15
4	20 00	$\frac{1}{2}$	165 gals.	15 to 20
5	25 00	$\frac{3}{4}$	250 gals.	20 to 30
6	30 00	$\frac{3}{4}$	350 gals.	30 to 45
7	40 00	1	500 gals.	45 to 65
8	45 00	1	600 gals.	65 to 80
9	55 00	1 $\frac{1}{4}$	800 gals.	80 to 100
10	60 00	1 $\frac{1}{4}$	1000 gals.	100 to 130
11	75 00	1 $\frac{1}{2}$	1300 gals.	130 to 170
12	90 00	1 $\frac{1}{2}$	1750 gals.	170 to 230
13	110 00	2	2300 gals.	230 to 300
14	125 00	2	2850 gals.	300 to 375

METROPOLITAN AUTOMATIC INJECTORS.

DIRECTIONS FOR CONNECTING AND OPERATING.

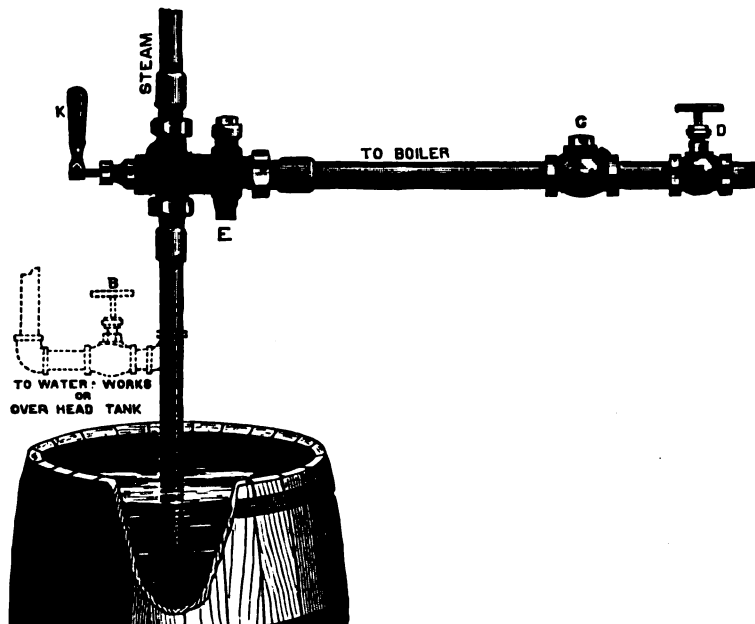


Plate 1161.

Connections.—Connect the Injector so that the boiler connection of the Injector is horizontal, the steam connection on top and the water suction below, as shown in cut. Place Check Valve C in the delivery pipe between the Injector and the boiler.

When Lifting.—If more than 10 feet of suction pipe is used it should be one or two sizes larger than the Injector fittings and should be reduced at the Injector. Never use a foot valve in the suction pipe.

When Non-Lifting.—Place a Globe Valve B in the suction pipe, as shown by dotted line connection in cut.

The Overflow E is threaded so a pipe can be screwed on it. We advise using a short pipe not smaller than overflow connection, not over 4 feet long, and it must be free from elbows, or short turns, with the end open to allow the free escape of steam.

To Start.—Open Steam Valve K about one-half turn.

To Stop.—Close Steam Valve K.

NOTE.—Should steam pressure be over 80 pounds or should the lift be over 10 feet, open Steam Valve K full. Should Injector be placed under a heavy water pressure, the globe valve in suction pipe should be throttled.

PARTS FOR METROPOLITAN INJECTOR.

No.	2-3	3½-4	5-6	7-8	9-10	11-12	13-14
S Steam Jet	\$0 75	1 00	1 25	1 50	1 75	2 00	2 50
V Suction Jet	50	60	70	90	1 20	1 40	1 60
C-D-R Combining and Delivery Tube and Aux. Check	2 00	2 50	3 00	3 50	4 00	5 00	7 00
P Overflow Valve	50	60	70	80	1 00	1 20	1 40
O Steam Plug	80	90	1 00	1 20	1 40	1 60	1 80
M Steam Valve and Stem	90	1 00	1 00	1 30	1 50	1 70	1 90
N Packing Nut	30	40	50	70	1 00	1 20	1 40
K Steam Valve Handle	60	70	80	1 00	1 20	1 40	1 60
Complete Nut and Tail Pipe	1 00	1 50	2 00	3 00	4 00	5 00	6 00

THE METROPOLITAN DOUBLE-TUBE INJECTOR.

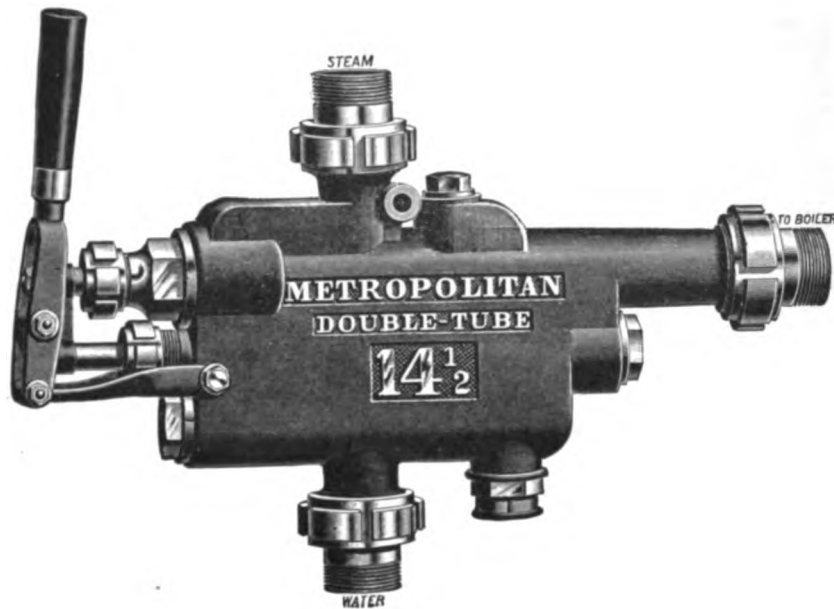


Plate 1162.

This Injector is operated entirely by one handle, and no adjustment is required under varying steam pressures.

It will start readily with 25 pounds of steam, and will work to 250 pounds without readjustment.

It will handle feed water up to 150 degrees, and is capable of delivering water into the boiler as high as 300 degrees.

It is the highest possible standard both as to workmanship and operation.

METROPOLITAN DOUBLE-TUBE INJECTOR.

Size	Price	—Size of Pipe Connections—			Capacity with	Horse Power	Drip Funnel
		Steam	Suction	Delivery	100 lbs. Steam Pressure, 4 ft. lift		
2½	\$ 18 00	½	½	½	120 gals.	8 to 15	\$1 00
4½	20 00	½	½	½	165 gals.	15 to 20	1 00
5½	25 00	¾	¾	¾	250 gals.	20 to 30	1 25
6½	30 00	¾	¾	¾	350 gals.	30 to 45	1 25
7½	40 00	1	1	1	500 gals.	45 to 65	1 50
8½	45 00	1	1	1	600 gals.	65 to 80	1 50
9½	55 00	1¼	1¼	1¼	800 gals.	80 to 100	2 00
10½	60 00	1¼	1¼	1¼	1000 gals.	100 to 130	2 00
11½	75 00	1½	1½	1½	1300 gals.	130 to 170	2 50
12½	90 00	1½	1½	1½	1750 gals.	170 to 230	2 50
13½	110 00	2	2	2	2300 gals.	230 to 300	3 00
14½	125 00	2	2	2	2850 gals.	300 to 375	3 00
15½	150 00	2½	2½	2½	3500 gals.	375 to 500	3 50
16½	200 00	2½	2½	2½	4200 gals.	500 to 650	3 50
17½	250 00	3	3	3	4700 gals.	650 to 775	4 00
18½	300 00	3	3	3	5500 gals.	775 to 950	4 00

STEAM BOILER FEED PUMP.

FOR POWER, WITH AIR CHAMBER.

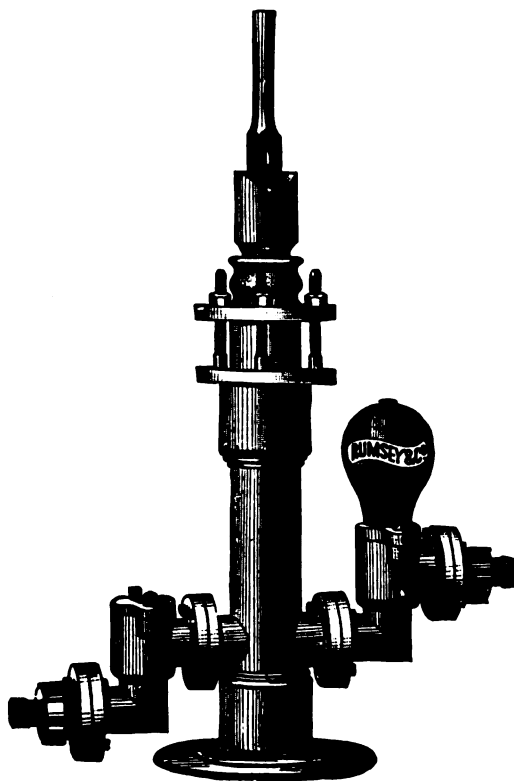


Plate 1163.

Plate 1163 accurately represents our Champion Power Boiler Feeding Pump, having an Air Chamber on the Discharge Valve. This Pump is the strongest and best article of the kind made. The Valves and Seats are of bronze, and held in place by an ingenious device of our own invention, by means of which they can be removed for renewal or repair at a trifling cost, and without the aid of a skilled mechanic. Every part is simple, durable and fitted to exact gauges, so that in case of need, duplicates can be had which are sure to fit. All sizes are made with Brass Plungers, and Brass Nuts on Studs of Stuffing-gland. We furnish all appliances for attaching power, such as Countershafts, Hangers, Post-boxes, Pulleys or Gears, Crank Plate, Wrist Pin and Stub Ends, at a small advance on cost of material and labor.

	Size Pipe, Inches	Diameter Plunger, Inches	Stroke, Inches	Capacity per Rev., Gallons	Revs. per Minute	Horse Power Boiler	Price
No. 1	1	1½	12	1½	40	40	\$35 00
No. 2	1	2	12	1	40	60	40 00
No. 3	1¼	2½	12	¾	40	100	50 00
No. 4	1½	3	12	½	40	150	60 00

ON BASE.



Plate 1164.

THE RELIABLE BOILER FEEDER.

Plates 1164 and 1165 show our smallest Boiler Feed Pump. It is capable of feeding up to 20 Horse Power Boiler, but we guarantee it to supply up to 15 Horse Power. It has an Automatic Balance Valve, and it will start by merely turning on steam; can be regulated to any speed and can be adjusted to feed the water into the Boiler as is required. For a small Boiler it can run very slowly, and faster for a larger Boiler. It is suitable for any duty as it pumps hot or cold water.

BRACKET PUMP.

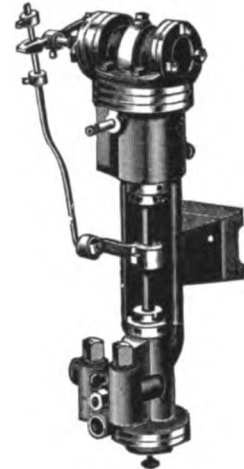


Plate 1165.

Horse Power Boiler it will supply	Steam Cylinder In.	Water Cylinder In.	Stroke, In.	Capacity per Minute at Speed Stated	Steam Pipe, In.	Exhaust Pipe, In.	Suction Pipe, In.	Delivery Pipe, In.	Price
15	2½	1¼	2½	150 strokes, 2 gallons	1¼	¾	½	½	\$32 00

BALL VALVE, POSITIVE ACTING BOILER-FEED STEAM PUMP.

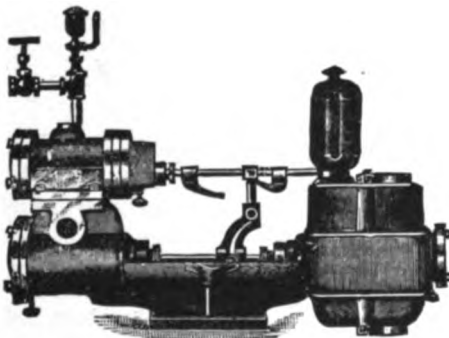


Plate 1166.

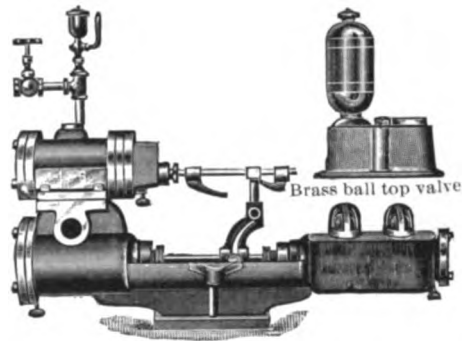


Plate 1167.

Shows the Pump apart.

For pumping hot or cold water or other liquids. It is operated by steam and is provided with an outlet exhaust for starting, and as soon as started, the exhaust steam is turned into the suction condensing chamber, the steam being condensed, warms the water that goes into the Boiler. This water may also pass through a heater between Pump and Boiler. It is sure and positive in action. It being its own condenser, it takes less steam to operate than others. As a fire pump, it can be worked very rapidly, and cannot possibly become injured by rapid motion.

A Foot Valve with Strainer should always be used on the Suction Pipe.

Horse Power Boiler it will supply	Steam Cylinder, In.	Water Cylinder, In.	Stroke, In.	Capacity per Minute at Speed Stated	Steam Pipe, In.	Exhaust Pipe, In.	Suction Pipe, In.	Delivery Pipe, In.	Floor Space Required, In.	Price
20	3	1½	3	150 strokes, 3½ gallons	¾	½	¾	½	24 x 6	\$50 00

RIVAL BOILER STEAM PUMPS.

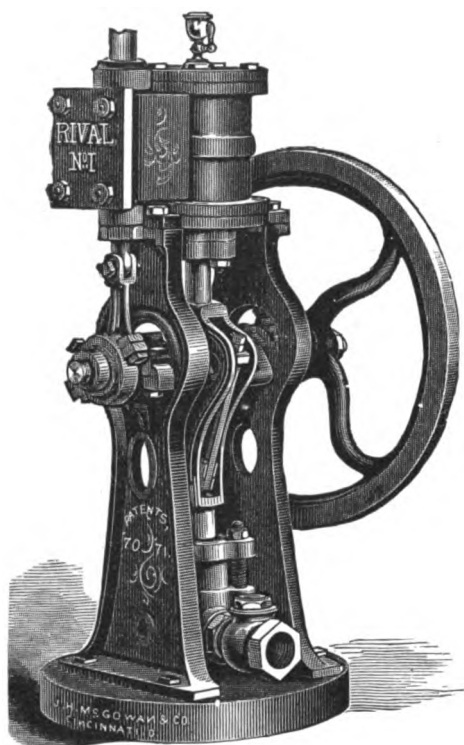


Plate 1168.

The Rival Boiler Feeder is direct acting, the steam acting directly on the double-end plunger. The Steam Cylinder has metallic spring packing. The Steam Valve is the common Slide Valve, operated by eccentric driven by the Crank Shaft. The Crank Shaft is made of best forged iron, and connected to the Plunger by an adjusting link or Pitman. The Pump end of this pattern has a single-acting solid Plunger, packed in the same way as the upper or Steam Piston, with round or square packing. The Valves and Seats are brass, and extra heavy, and designed for this Pump. They have large openings and Cup Valves, which suits them for high speed.

The Rival can be run faster than any other steam pump. The smallest size will raise water from well or cistern, and deliver a constant stream 50 to 70 feet from end of hose nozzle. These Pumps will handle hot or cold water without changing any of the parts. We furnish with each bracket pump a crank and handle to screw on the main shaft for pumping by hand, and for washing out or pumping up the boiler.

To pipe these Pumps to operate to best advantage, the Inlet Pipe should be as short as possible and full size, particularly when hot water is to be pumped, to insure a full supply to pump. If the Inlet Pipe is long, a Vacuum Chamber should be attached near the Pump, which can be made by attaching to a "T" an upright pipe closed at the top end. By the addition of an Air Chamber to the Force Pipe, made in the above manner, the Pump can be worked at a high speed.

Pump on Base	Diameter Steam Cylinder, Inches	Diameter Water Plunger	Stroke, Inches	Size Steam Pipe, Inches	Size Escape Pipe, Inches	Size Suction and Supply, Inches	Revolutions per minute	Gallons per minute	Horse-Power it will Feed easily	Price
No. 50	2½	1¼	2	¼	½	¾	110	1.05	8	\$ 38 00
No. 1	3	1½	2½	⅜	½	1	100	1.89	15	49 00
No. 2	3½	2	2½	⅜	½	1	100	3.39	27	60 00
No. 3	4	2½	3	½	¾	1¼	90	5.72	45	71 00
No. 4	4½	3	3	½	¾	1½	85	7.72	62	88 00
No. 5	5	3½	4	¾	1	2	80	13.32	106	108 00
No. 6	6	4	5	1	1¼	2½	75	20.48	163	160 00

Pump on Bracket	Diameter Steam Cylinder, Inches	Diameter Water Cylinder	Stroke, Inches	Size Steam Pipe	Size Escape Pipe	Size Suction Pipe	Size Supply Pipe	Revolutions per minute	Gallons per minute	Price
O	2½	1¾	2	¼	½	½	⅜	130	1.25	\$ 43 00
A	3	1½	2½	⅜	½	¾	½	120	2.20	54 00
B	3½	2	2½	⅜	½	¾	½	100	3.39	70 00
C	4	2½	3	½	¾	1¼	1	90	5.72	90 00
D	4½	3	3	½	¾	1½	1¼	85	7.72	108 00

THE GARDNER AUTOMATIC FEED PUMP AND RECEIVER.

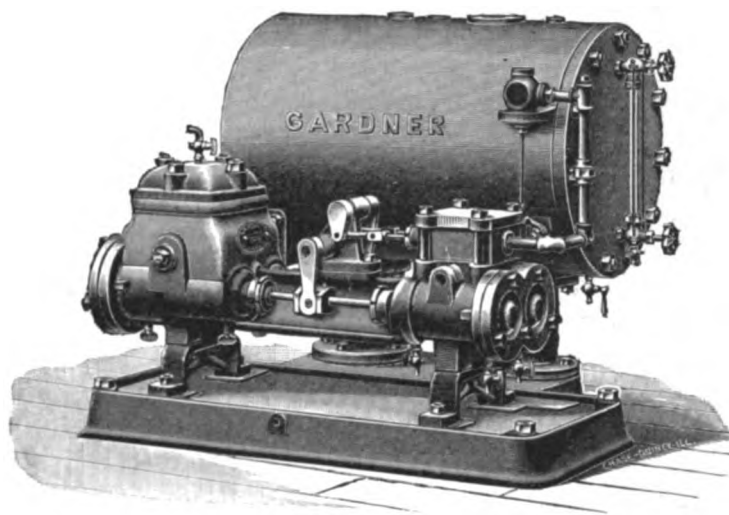


Plate 1169.

In large buildings, such as factories, hotels and apartment houses, where steam is used for heating purposes, it is desirable and economical to use a device for draining the radiators, coils and steam pipes, and also to feed back automatically to the boilers the water of condensation while it is in the hottest condition. Such a device will prevent the disagreeable hammering and snapping of steam pipes, and in manufacturing establishments it is a great source of economy in coal consumption and materially increases the efficiency of the heating plant.

The Gardner Automatic Feed Pump and Receiver was designed to meet the several requirements of this service with the simplest form of construction. Its appearance is shown by the illustration. It occupies a very small space and is low enough to drain the lowest line of pipe in a steam heating system, which is a great advantage over devices arranged with the Receiver over the Pump.

Its operation is as follows: The supply of steam which operates the Pump is controlled by a valve and float in the Receiver. As the condensed water falls into the Receiver from the coils, the float rises and acting on the valve causes it to admit steam into the Pump. This hot water is fed at once to the boiler. The fall of the water lowers the float and slackens the speed of the Pump, so at all times the Pump automatically feeds the boiler when the water enters into the Receiver.

With the Pump and Receiver are furnished the following attachments: Glass Water Gauge, Drain Cocks, Air Cocks, and the Suction and Steam Pipe Connections as shown in the engraving.

The following list gives the sizes usually kept in stock. Other sizes for special service can be furnished if required.

	Size of Pump	Gallons Delivered per Minute	Square Feet Radiating Surface will Drain	Space Occupied			Price	Weight
				Length	Width	Height		
No. 0	2½ x 1½ x 3	06	2,500	24¼	23¼	18¾	\$145 00	310
No. 1	3 x 2 x 3	12	5,000	24¼	23¼	19	155 00	360
No. 1½	4 x 2½ x 4	15	7,000	33	31	29	175 00	770
No. 2	4½ x 3 x 4	20	10,000	37	31	30	200 00	870
No. 3	5¼ x 3½ x 6	35	20,000	42¾	40½	34½	250 00	1500
No. 4	6 x 4 x 6	60	40,000	42¾	40½	35	285 00	1650

THE GARDNER IMPROVED DUPLEX PUMP.

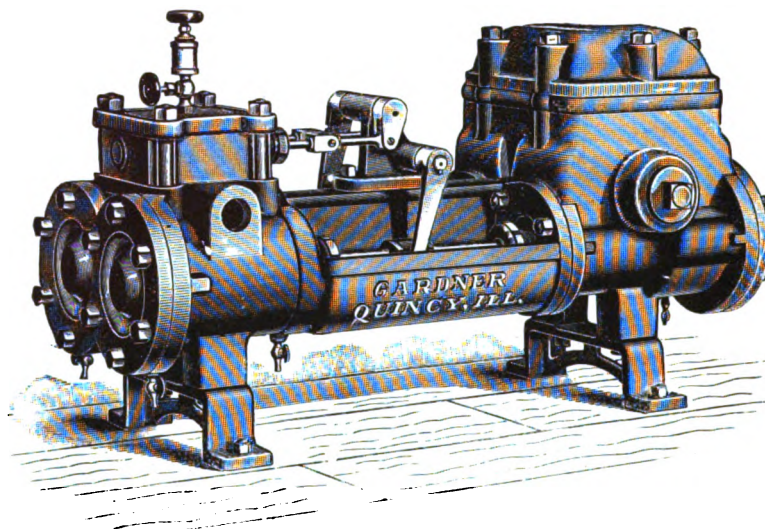


Plate 1170.

This cut illustrates the Gardner Pump of ordinary pattern, having two Double-Acting Plungers or Pistons, and fitted with water valves of rubber or metal, as required. These Pumps are designed for boiler feeding, fire, hydraulic elevators, and general purposes where the pressure is not excessive. The capacities given below are based on piston travel, about 50 to 100 feet per minute. In case of fire or other emergency, this speed can be largely increased. A slight additional charge is made when Pumps are fitted with composition rods and plungers. When ordering, always give size by diameter of steam cylinders and water plungers, and length of stroke. All Pumps are made on the interchangeable plan of duplication, so that worn or broken parts may be replaced with absolute certainty of a fit. All Pumps, both Piston and Plunger, are furnished with solid composition removable sleeves, or linings, without extra charge. Tobin Bronze Rods are used in all composition-fitted Pumps, and composition used is pure copper and tin. Piston Pumps will in all cases be shipped, unless the Plunger pattern is specially ordered. Composition Pistons or Plungers should be used when Pump is required to handle liquids injurious to steel or iron.

	Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke.	Displacements in Gals. per Stroke of one Plunger	Proper Strokes per Minute of one Plunger, varying with kind of work and pressure	Gallons per Minute by both Plungers, at stated number of Strokes	Price	Sizes of Pipes for Short Lengths, to be Increased as Length Increases				Approximate Weight	H. P. of Boiler, Based on 80 lbs. Water per hour
								Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe		
No. 0	2½	1½	3	.02	100 to 250	4 to 11	\$ 50 00	¾	½	1	¾	95	40
No. 00	3	2	3	.04	100 to 250	8 to 20	55 00	¾	½	1	¾	140	60
No. 1	3	2	3½	.05	100 to 250	10 to 25	60 00	¾	½	1¼	¾	200	70
No. 1½	4	2½	4	.08	100 to 250	16 to 32	80 00	¾	¾	1½	1¼	300	100
No. 2	4½	3	4	.12	100 to 200	24 to 50	90 00	¾	¾	2	1½	400	150
No. 3	5¼	3½	6	.24	100 to 150	50 to 75	120 00	1	1¼	2½	1½	650	300
No. 4	6	4	6	.33	100 to 150	70 to 100	140 00	1	1½	3	2	800	400
No. 5	7	4½	10	.69	75 to 125	100 to 170	300 00	1½	2	4	3	1,550	700
No. 6	8	5	10	.85	75 to 125	130 to 220	390 00	1½	2	5	4	2,500	800
No. 7	10	6	10	1.22	50 to 100	125 to 245	430 00	2	2½	5	4	2,600	1200
No. 8	12	7	12	2.00	50 to 100	200 to 400	550 00	2½	3	6	5	4,100	1400
No. 9	12	8	12	2.61	50 to 100	260 to 520	625 00	2½	3	7	6	4,800	.....
No. 10	12	10	12	4.07	50 to 100	407 to 814	720 00	2½	3	8	7	5,800	.....
No. 11	14	8	12	2.61	50 to 100	260 to 520	650 00	2½	3	7	6	4,950	.....
No. 12	14	10	12	4.07	50 to 100	407 to 814	775 00	2½	3	8	7	5,800	.....
No. 13	14	12	12	5.87	50 to 100	587 to 1174	920 00	2½	2	10	8	6,800	.....
No. 13A	16	9	12	3.30	50 to 100	330 to 660	800 00	2½	3	8	6	6,500	.....
No. 14	16	10	12	4.07	50 to 100	407 to 814	835 00	2½	3	8	7	6,500	.....
No. 15	16	12	12	5.87	50 to 100	587 to 1174	975 00	2½	3	10	8	7,100	.....
No. 16	16	14	12	7.99	50 to 100	799 to 1598	1,080 00	2½	3	12	10	8,300	.....
No. 17	18	10	12	4.07	50 to 100	405 to 814	980 00	3	4	8	7	7,500	.....
No. 18	18	12	12	5.87	50 to 100	587 to 1174	1,035 00	3	4	10	8	8,100	.....
No. 19	18	14	12	7.99	50 to 100	799 to 1598	1,150 00	3	4	12	10	9,400	.....
No. 20	20	12	12	5.87	50 to 100	587 to 1174	1,200 00	4	5	10	8	8,400	.....
No. 21	20	14	12	7.99	50 to 100	790 to 1598	1,350 00	4	5	12	10	10,000	.....

Composition Pistons and Plungers will be furnished at slight additional cost. Composition Piston and Plunger Rods should be used when Pump is required to handle liquids injurious to steel and iron.
Hot water should always flow to Pump by gravitation. Send for Special Pump Catalogue.

THE GARDNER LOW SERVICE AND TANK PUMP.

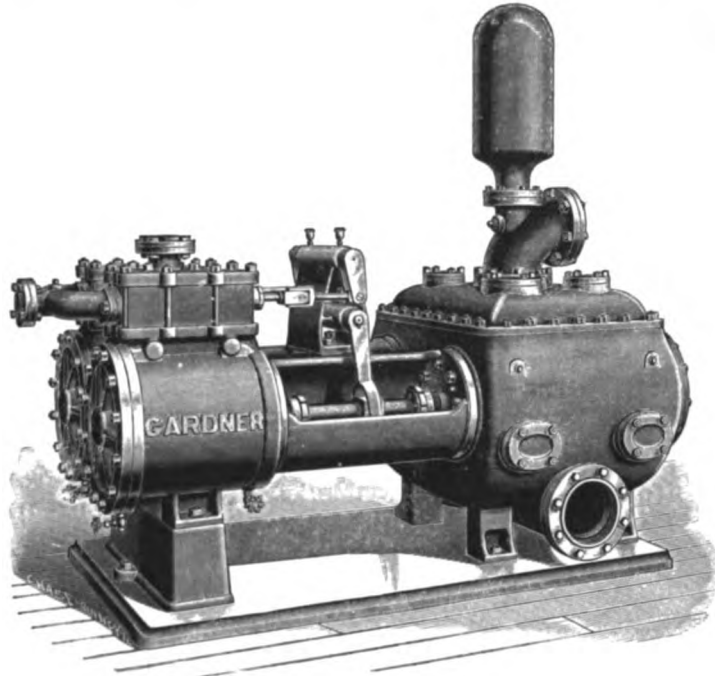


Plate 1171.

This cut illustrates the Gardner Low Service Pump, designed for pumping water and other liquids to limited heights and distances. They are largely used for railroad water stations and general tank supply, including breweries, distilleries, oil works, refineries, etc. The Steam Cylinders in proportion to Water Cylinders are smaller in diameter than the regular pressure pumps, consequently first cost is less for amount of water pumped. A variety of valves are used, best adapted for pumping hot, cold, thick, thin, salt, alkaline and other liquids. These Pumps are made of the Plunger or Piston pattern, as may be preferred.

	Diameter of Steam Cylinder	Diameter of Water Cylinder	Length of Stroke	Displacements in Gallons per Stroke of one Plunger	Proper Stroke per Minute of one Plunger, varying with kind of work and pressure	Gallons per Minute by both Plungers, by stated number of strokes	Price	Size of Pipes for Short Lengths, to be increased as length increases				Approximate Weight
								Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	
No. 22	4 1/2	3 3/4	4	.20	100 to 200	40 to 80	\$ 115 00	1/2	3/4	2 1/2	2	450
No. 23	5 1/4	4 3/4	6	.38	100 to 150	75 to 110	155 00	1	1 1/4	3	2	700
No. 24	6	5 3/4	6	.67	100 to 150	130 to 195	200 00	1	1 1/2	4	3	950
No. 25	7	5	10	.85	75 to 125	133 to 220	330 00	1 1/2	2	4	3	1,650
No. 26	8	6	10	1.22	75 to 125	180 to 300	400 00	1 1/2	2	5	4	2,600
No. 27	8	7	10	1.66	75 to 125	245 to 410	460 00	1 1/2	2	6	5	2,900
No. 28	8	8	10	2.17	75 to 125	325 to 540	490 00	1 1/2	2	6	5	2,900
No. 29	10	7	10	1.66	75 to 125	245 to 410	500 00	2	2 1/2	6	5	3,000
No. 30	10	8	10	2.17	75 to 125	325 to 540	530 00	2	2 1/2	6	5	3,000
No. 31	12	8	12	2.61	75 to 125	390 to 650	625 00	2 1/2	3	7	6	4,800
No. 32	12	10	12	4.07	75 to 125	610 to 1015	720 00	2 1/2	3	8	7	5,400
No. 33	12	12	12	5.87	50 to 100	580 to 1170	825 00	2 1/2	3	10	8	6,500
No. 34	14	10	12	4.07	50 to 100	405 to 810	775 00	2 1/2	3	8	7	5,800
No. 35	14	12	12	5.87	50 to 100	580 to 1170	920 00	2 1/2	3	10	8	6,800
No. 36	14	14	12	8.00	50 to 100	800 to 1600	1,000 00	2 1/2	3	12	10	7,500
No. 37	16	12	12	5.87	50 to 100	580 to 1170	975 00	2 1/2	3	10	8	7,100
No. 38	16	14	12	8.00	50 to 100	800 to 1600	1,080 00	2 1/2	3	12	10	8,300
No. 39	18	12	12	5.87	50 to 100	580 to 1170	1,035 00	3	4	10	8	8,100
No. 40	18	14	12	8.00	50 to 100	800 to 1600	1,150 00	3	4	12	10	9,400
No. 41	20	14	12	8.00	50 to 100	800 to 1600	1,350 00	4	5	12	10	10,000

A slight additional charge is made when pumps are fitted with composition rods and plungers or pistons. Composition plungers and pistons should be used when pump is required to handle liquids injurious to steel or iron. Send for Special Pump Catalogue.

THE GARDNER STANDARD FIRE PUMP.

ACCORDING TO STOCK FIRE INSURANCE COMPANIES' REQUIREMENTS.

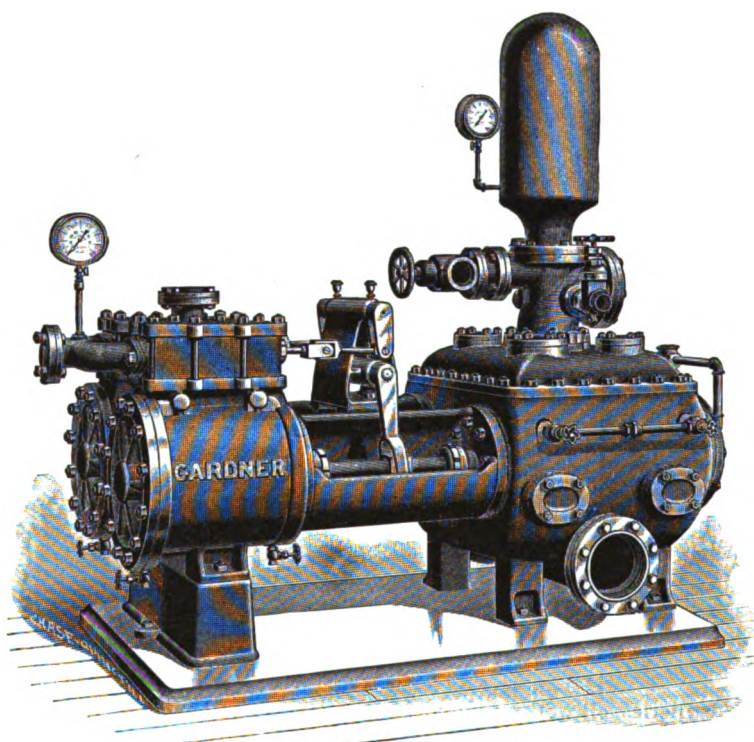


Plate 1172.

The cut above illustrates the Standard Fire Pump, ordinary Duplex type, built in an especially heavy and substantial manner, with improvements and attachments required by the Committee on Improved Risks of the Stock Fire Insurance Companies. These pumps have been thoroughly tested and fully accepted by them, and they are sold with a guarantee that they are made strictly in accordance with their specifications, which are as follows:

Pump guaranteed to be of first-class material and finish, and tested to a minimum pressure of 225 pounds to the square inch at the water ends before leaving the works. Brass Removable and Interchangeable Water Cylinders; Brass Plungers; Solid Tobin Bronze Piston Rods; Brass Stuffing Box Glands; Steel Rocker Shafts working in Brass Linings, and all parts working in contact with steel or iron to be made of brass; two 2½ inch Hose Valve Connections; Automatic Steam Regulator of — make; Relief Valve of approved make; Brass Priming Pipes and Valves, with 2 inch inlet connection; Steam and Water Pressure Gauges, one each; Sight-Feed Lubricator.

	Diameter Suction Pipe, Inches	Diameter Discharge Pipe, Inches	Steam Pipe, Inches	Exhaust Pipe, Inches	Air Chamber to contain Gallons	Relief Valve, Inches	No. of Hose Con- nec- tions	Capacity of Pump, Gals. per Minute
Size, 14 x 7 x 12	7	6	2½	3	10	2½	2	550
Size, 16 x 8 x 12	8	6 or 7	2½	3	15	3	2	750
Size, 16 x 9 x 12	8	7	3	4	15	3	2	900
Size, 18 x 9 x 12	8	7	3½	4	20	3½	2	900
Size, 18 x 10 x 12	10	8	3½	4	20	3½	2	1200
Size, 20 x 10 x 12	10	8	3½	4	20	4	2	1200

Prices on application.

These capacities are all in accordance with the specifications of the Committee on Improved Risks of the Stock Fire Insurance Companies, but may be largely increased in case of emergency. Fire Pumps may be run at the highest speed possible, without causing violent jar or hammering within the Cylinder.

We make a specialty of Fire Pumps, complying with all specifications as adopted by the various Insurance Companies, and we furnish every pump with a guarantee that it shall fully meet all requirements and prove entirely satisfactory. Particulars and prices on application.

THE GARDNER COMPOUND DUPLEX STEAM PUMP.

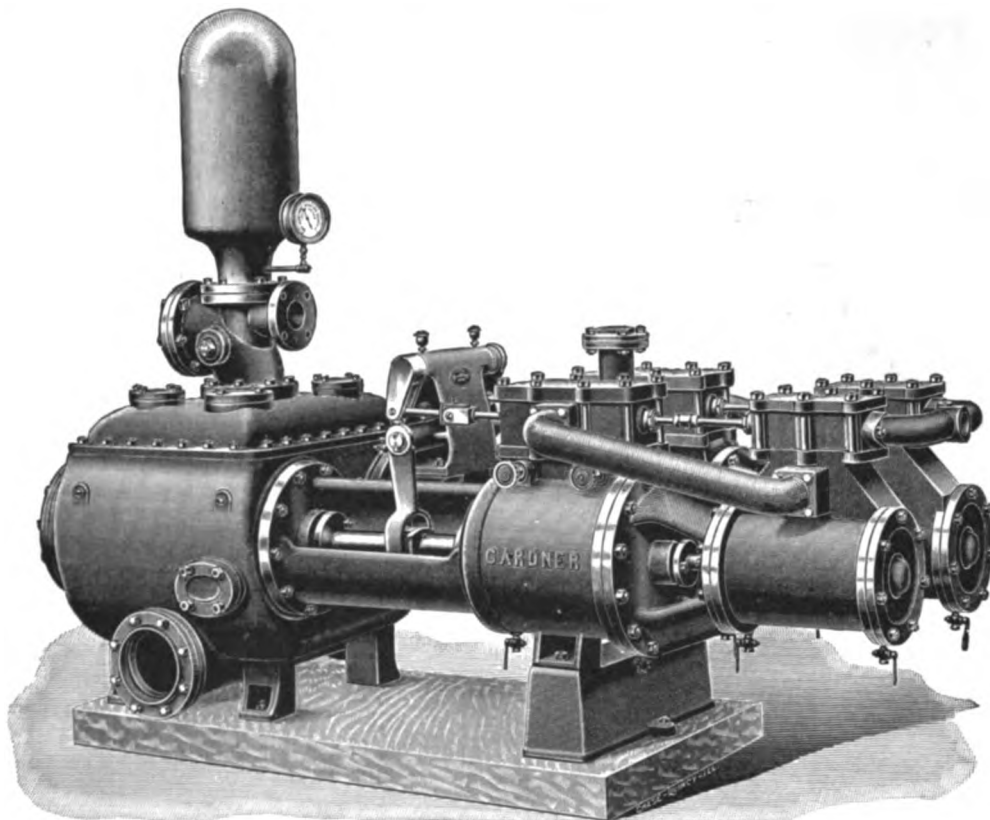


Plate 1173.

The above cut illustrates the Gardner Compound Duplex Steam Pump, showing a section through center of one side. By this arrangement of steam cylinders the steam is used expansively, and the economic effect of a cut-off is obtained. Steam is first used in the pair of high pressure cylinders, and then exhausted into the pair of low pressure cylinders. A saving of 25 to 30 per cent of fuel is obtained over the ordinary Pump. This principle of expansion without condensation cannot be used to advantage where the steam pressure is below 50 pounds. Although somewhat higher in first cost, the additional expenditure is soon repaid by the saving in fuel. The water passages and valve areas are very large, and all parts easily accessible. Complete drawings will be furnished on application.

Diameters of Steam Cylinders	Diameter of Water Plunger	Length of Stroke	Displacement in Gallons per Stroke of one Plunger	Proper Strokes per Minute of one Plunger	Gallons Delivered by both Plungers, at stated num- ber of strokes	Price	Sizes of Pipe for Short Lengths, to be increased as Length increases.			
							Steam Pipe	Exhaust Pipe	Suction Pipe	Disch'ge Pipe
8	12	7	2.00	50 to 100	200 to 400	\$ 825	1½	3	6	5
8	12	8	2.61	50 to 100	260 to 520	910	1½	3	7	6
8	12	10	4.07	50 to 100	407 to 814	1000	1½	3	8	7
8	12	12	5.87	50 to 100	587 to 1174	1140	1½	3	10	8
10	16	7	2.00	50 to 100	200 to 400	1060	2	3	6	5
10	16	8	2.61	50 to 100	260 to 520	1125	2	3	7	6
10	16	10	4.07	50 to 100	407 to 814	1200	2	3	8	7
10	16	12	5.87	50 to 100	587 to 1174	1350	2	3	10	8
12	18	8	2.61	50 to 100	260 to 520	1410	2½	4	7	6
12	18	10	4.07	50 to 100	407 to 814	1500	2½	4	8	7
12	18	12	5.87	50 to 100	587 to 1174	1640	2½	4	10	8
14	20	10	4.07	50 to 100	407 to 814	1650	3	5	8	7
14	20	12	5.87	50 to 100	587 to 1174	1760	3	5	10	8
14	20	14	7.99	50 to 100	790 to 1598	2000	3	5	12	10

For brass-fitted Pumps an extra charge will be made. Send for Special Pump Catalogue.

KNOWLES' OR BLAKE'S SPECIAL DUPLEX PUMPS.

BOILER FEED OR PRESSURE PUMPS, REGULAR PISTON PATTERN.

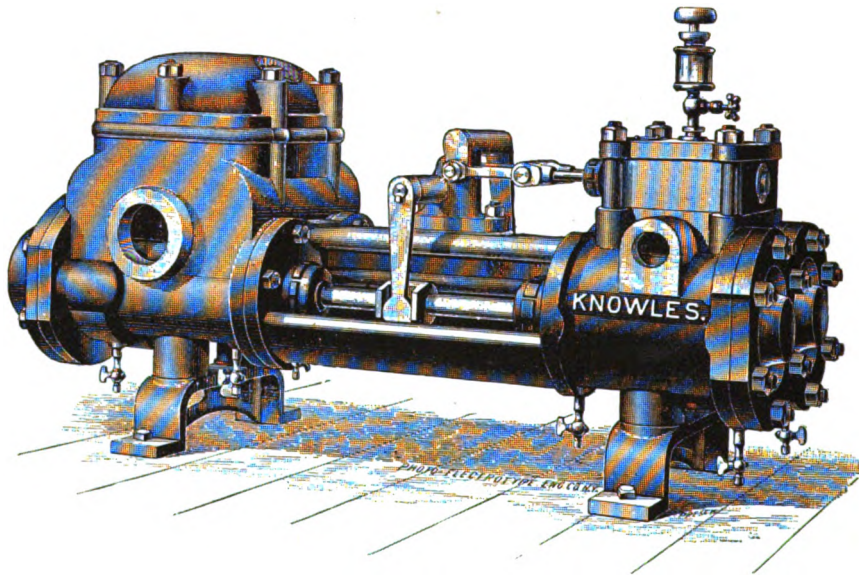


Plate 1174.

Below is given a list of small size Duplex Pressure Pumps for general duty. These pumps are built heavy and strong, and designed throughout to perform most excellent service with a minimum cost for repairs.

The slide valves are of the plain D form, the steam pistons fitted with self-adjusting packing rings (understood by every engineer), and the piston rods made of steel. The water cylinders possess a special feature, i. e., they are fitted with composition removable linings, and the water pistons made adjustable and packed so that the packing may be renewed or set out from time to time, and the machines kept in perfect working order without sending to the manufacturers for repairs.

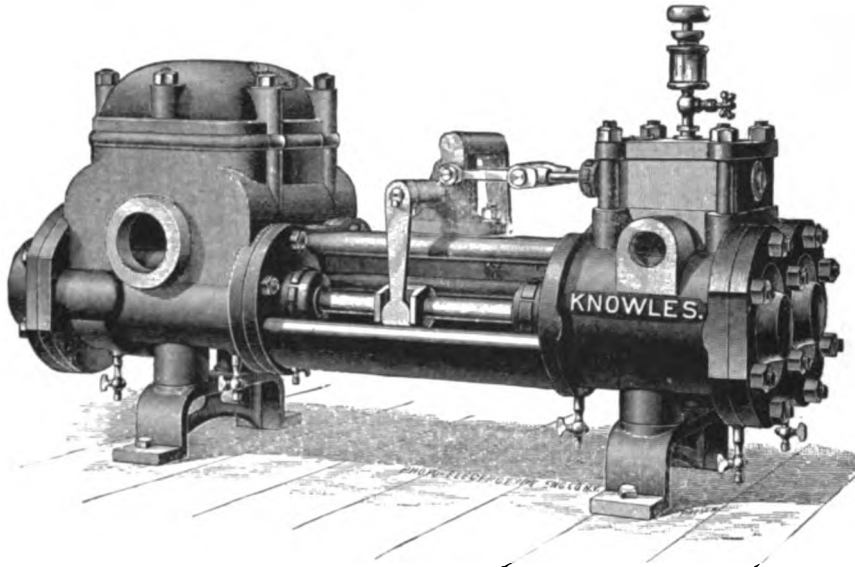
These pumps are equally well adapted to pumping hot or cold water. When desired, they are composition fitted throughout at a slight additional cost.

Steam Cylinders, Inches	Water Cylinders, Inches	Stroke, Inches	Capacity in Gallons per Stroke, each Piston	Strokes per Minute, each Piston	Capacity of both Cylinders, per Minute	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Delivery Pipe, Inches	Price	Weight, Pounds	Floor Space, Inches
2	1 1/4	2 3/4	.014	100 to 300	2 to 8	3/8	1/2	1	3/4	\$ 45 00	100	9 x 26
3	2	3	.04	100 to 250	8 to 20	3/8	1/2	1 1/4	1	60 00	180	10 x 26
4 1/2	2 3/4	4	.10	100 to 200	20 to 40	1/2	3/4	2	1 1/2	90 00	410	12 x 33
5 1/4	3 1/2	5	.20	100 to 200	40 to 80	3/4	1 1/4	2 1/2	1 1/2	120 00	650	16 x 37
6	4	6	.33	100 to 150	66 to 100	1	1 1/2	3	2	150 00	720	17 x 43
7 1/2	4 1/2	6	.42	100 to 150	85 to 125	1 1/2	2	4	3	220 00	990	20 x 46
7 1/2	5	6	.51	100 to 150	100 to 150	1 1/2	2	4	3	225 00	1000	20 x 46
7 1/2	4 1/2	10	.69	75 to 125	100 to 170	1 1/2	2	4	3	350 00	1600	20 x 58

Also patterns for larger sizes.

KNOWLES' OR BLAKE'S SPECIAL DUPLEX PUMPS.

TANK OR LIGHT SERVICE PUMPS, REGULAR PISTON PATTERN.

**Plate 1175.**

For pumping water or other liquids to limited heights and distances these pumps possess special advantages. The steam cylinders, in proportion to the water cylinders, are made smaller in diameter than with the regular pressure pumps, consequently the first cost is less for amount of water pumped. These pumps are principally used at railroad water stations, gas and oil works, bleacheries, tanneries, refineries, plantations, distilleries, etc. A variety of valves is used, best adapted to pumping hot, cold, thick, thin, salt, alkaline or other liquids. The pump pistons and other working parts are also especially adapted to the particular requirements.

For use in factories or at railroad stations for drawing water by suction from artesian wells or running streams these pumps have no equal. They are not only the best suction pumps, but, having adjustable packed water pistons, the efficiency of the pump end can always be relied on, where other pumps with no adjustment become worn and fail to perform the service. When desired, these pumps are composition-fitted throughout at slight additional cost.

Steam Cylinders, inches	Water Cylinders, inches	Stroke, inches	Capacity in Gallons per Stroke each Piston	Strokes per Minute each Piston	Capacity of Both Cylinders per Minute	Steam Pipe, inches	Exhaust Pipe, inches	Suction Pipe, inches	Discharge Pipe, inches	Price	Weight, Pounds	Floor Space, inches
4 1/2	3 3/4	4	.20	100 to 200	40 to 80	1/2	3/4	2 1/2	1 1/2	\$ 105	475	13 x 34
5 1/2	4 3/4	5	.38	100 to 150	75 to 110	3/4	1 1/4	3	2 3/8	140	750	15 x 42
6	5 3/4	6	.67	100 to 150	130 to 195	1	1 1/2	4	3	190	850	16 x 44
6	7 1/2	6	1.14	100 to 150	225 to 340	1	1 1/2	6	5	250	1400	19 x 44
6	8 1/2	6	1.47	100 to 150	295 to 440	1	1 1/2	6	5	260	1450	20 x 49
7 1/2	6	6	.73	100 to 150	146 to 220	1 1/2	2	4	3	225	1455	17 x 44
7 1/2	7 1/2	6	1.14	100 to 150	225 to 340	1 1/2	2	6	5	265	1575	20 x 49
7 1/2	8 1/2	6	1.47	100 to 150	295 to 440	1 1/2	2	6	5	275	1575	20 x 49
7 1/2	6	10	1.22	75 to 125	180 to 300	1 1/2	2	5	4	400	2075	20 x 60
7 1/2	7	10	1.66	75 to 125	245 to 410	1 1/2	2	6	5	470	2100	20 x 60

Also patterns for larger sizes.

KNOWLES' BOILER FEED OR PRESSURE PUMPS. FOR HOT OR COLD WATER.

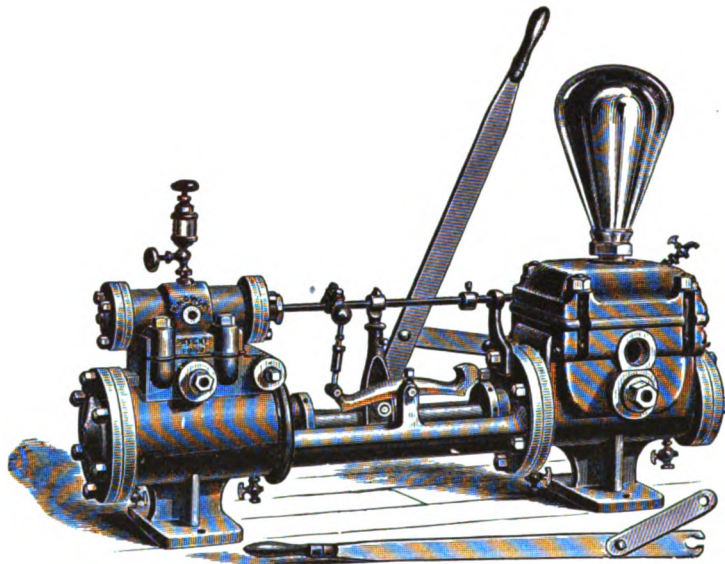


Plate 1176.

In the manufacture of Knowles' Steam Pumps the best composition metal (Government standard) is used for the Piston Rods, Stuffing Boxes, Valve Seats and Water Cylinder Linings. The Water Pistons are also made of composition, and are packed with a special form of adjustable packing, adapted for either hot or cold liquids. All parts are made to gauge, and are therefore interchangeable. These pumps have large direct water passages and full Valve area, which admits of a speed that makes them very efficient Fire Pumps. The pump can be made to run at any speed desired—an important feature in the feeding of Boilers.

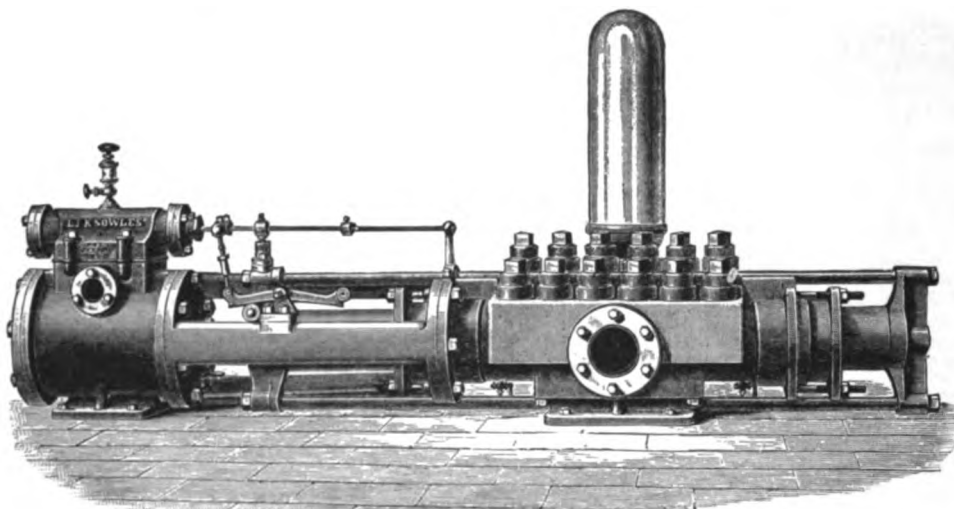
Number	Steam Cylinder, Inches	Water Cylinder, Inches	Stroke, Inches	Gallons per Stroke	* Capacity per Minute at Speed Stated	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Delivery Pipe, Inches	Space required, Inches	Weight, about Lbs.	Prices
000	2½	1½	3	.023	150 strokes, 3½ gals.	¼	¾	½	¾	17 x 5	35	40 00
00	3	1¾	3	.031	150 strokes, 4¾ gals.	¼	¾	½	¾	18 x 5	45	55 00
0	3¼	2	4	.05	150 strokes, 7½ gals.	¼	¾	1¼	1	26 x 6	150	85 00
1	3½	2¼	4	.07	150 strokes, 10½ gals.	¼	¾	1¼	1	28 x 7	175	125 00
2	4	2½	5	.11	150 strokes, 16½ gals.	½	¾	1¼	1	31 x 8	200	150 00
3	5	3¼	7	.25	125 strokes, 31 gals.	¾	1	2	1½	44 x 13	425	200 00
4	5½	3¾	7	.34	125 strokes, 42 gals.	¾	1	2	1½	45 x 14	450	225 00
4½	7	4	7	.39	125 strokes, 49 gals.	1	1¼	2½	2	45 x 14	500	275 00
5	7	4½	10	.69	100 strokes, 69 gals.	1	1¼	3	2½	55 x 16	875	350 00
6	7½	5	10	.85	100 strokes, 85 gals.	1	1¼	3	2½	55 x 16	900	375 00
6½	8	5	12	1.02	100 strokes, 102 gals.	1	1¼	4	4	67 x 19	1,250	400 00
7	10	6	12	1.47	100 strokes, 147 gals.	1¼	1½	4	4	67 x 19	1,400	450 00
8	12	7	12	2.00	100 strokes, 200 gals.	2	2½	5	5	67 x 20	1,600	525 00
9	14	8	12	2.61	100 strokes, 261 gals.	2	2½	5	5	67 x 20	1,700	600 00
10	16	10	16	5.44	75 strokes, 408 gals.	2½	3	6	6	80 x 22	3,100	Prices on applica- tion
11	18	12	24	11.75	50 strokes, 588 gals.	3½	4	8	6	110 x 27	5,500	
12	20	14	24	16.00	50 strokes, 800 gals.	3½	4	10	8	111 x 29	6,500	

With Hand Power Attach.

* Twice the above capacities can be had in emergencies; but for continuous work, such as Boiler feeding, we advise about half the speed stated. Larger sizes on hand or to order on short notice. All sizes up to and including No. 6 have Suction and Delivery Openings on both sides; consequently, connections can be made on either side of pump desired. When ordering a pump, please answer the following questions: 1, Whether for hot or cold water? 2, What is the vertical lift of suction? 3, Length of Suction Pipe? 4, Against what pressure or what is the vertical height to which water is to be forced? 5, What is length of Discharge Pipe? 6, Amount of water needed per hour?

The Hand Power Attachments are invaluable, as the pump can be used when steam is down for filling Boilers after blowing off, washing decks, fire purposes, etc. The Hand Lever can be easily removed by simply lifting it from the pump.

Write for Steam Pump Catalogue.

KNOWLES' PATENT PLUNGER PUMP.**DOUBLE-ACTING.****FOR FEEDING BOILERS, PUMPING WATER CONTAINING SEDIMENT OR GRIT, ETC.****Plate 1177.**

Plunger Pumps for boiler-feeding, especially under the higher rate of pressures, have certain advantages over piston pumps. They are very efficient and remarkably durable—the only wearing part in the pump end being the packing of the Plunger Stuffing-boxes. No leak can occur there without being observed, and easily stopped by setting up the packing. The Plunger not touching the pump castings, there is no cutting or wear, consequently they require no reboring or refitting like piston pumps—when working on gritty or sandy water.

As feed pumps for steamboats of the western and southern rivers (where very high steam pressure is carried and where muddy water is the rule), the Knowles Plunger Pumps have no equal, and are fast superseding the expensive and cumbersome pumps known as doctors. They are particularly adapted for pumping gritty or muddy water from quarries, wells, pits and similar places.

These pumps are very strong, compact, and are made with the Water Cylinder and Chest in one piece. The Piston Rods do not enter the Pump Cylinders, and are therefore not exposed to the action of the water. The Plungers are connected by substantial Side-rods and Cross-heads. The Water Valves are of special form, made of gun-metal composition or rubber, according to circumstances. The gun-metal Valve Seats are made removable, and are held firmly in place by the Caps which form the Hand-hole Covers.

No.	Steam Cylinder, Inches	Water Plungers, Inches	Stroke	Gallons per Stroke	Capacity per Minute at ordinary speed	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Delivery Pipe, Inches	Floor Space required, Inches	Price
2	4	2½	5	.11	150 strokes, 16½ gallons	1½	¾	1¼	1	56 x 12	\$200 00
3	5½	3¼	7	.25	125 strokes, 31 gallons	¾	1	2	1½	71 x 14	275 00
4	6	3¾	7	.33	125 strokes, 42 gallons	¾	1	2	1½	71 x 14	300 00
5	7½	4½	10	.69	100 strokes, 69 gallons	1	1¼	3	2½	90 x 21	.....
6	8	5	10	.85	100 strokes, 85 gallons	1	1¼	3	2½	90 x 21	.....
7	12	6	12	1.47	100 strokes, 147 gallons	2	2½	4	4	100 x 24	.....
8	14	7	12	2.00	100 strokes, 200 gallons	2½	3	5	5	100 x 25	.....
9	16	8	12	2.61	100 strokes, 261 gallons	2½	3	5	5	.....	.....
10	18	10	16	5.44	75 strokes, 408 gallons	2½	3	6	6	.....	.....

All the working parts of these pumps are made to gauge, and are therefore interchangeable. Duplicate parts can be quickly substituted when old parts are worn or broken. Gun-metal composition of the best quality is used for such parts as are liable to be affected by bad water.

KNOWLES' PATENT TANK OR LIGHT SERVICE PUMPS.

For pumping water or other liquids to limited heights and distances these Pumps possess special advantages; they combine large pumping capacity with small expenditure of steam. The steam cylinders, in proportion to the pump cylinders, are made smaller in diameter than with the regular pressure pumps, consequently the first cost is less—for amount of water pumped. These Pumps are principally used at railroad water stations, gas and oil works, bleacheries, tanneries, refineries, plantations, distilleries, etc. A variety of valves are used adapted for pumping hot, cold, thick, thin, alkaline or other liquids.

For quarries and clay pits, also for coffer dams, tunnels, foundation pits, ore beds, sewerage and irrigating purposes, these Pumps are especially adapted, having large water passages and valve openings.

The water cylinders are arranged with composition linings, valve seats, valve bolts, water pistons, piston rods, stuffing-boxes; the water pistons are packed with a special form of adjustable packing. Auxiliary Boiler Feed Pumps (single action plungers) attached when required. Prices extra. Pumps with water cylinders entirely of composition, extra. The hand power attachment applied to the first four sizes. In ordering, parties will please state fully the duty to be performed, also size and length of pipes.

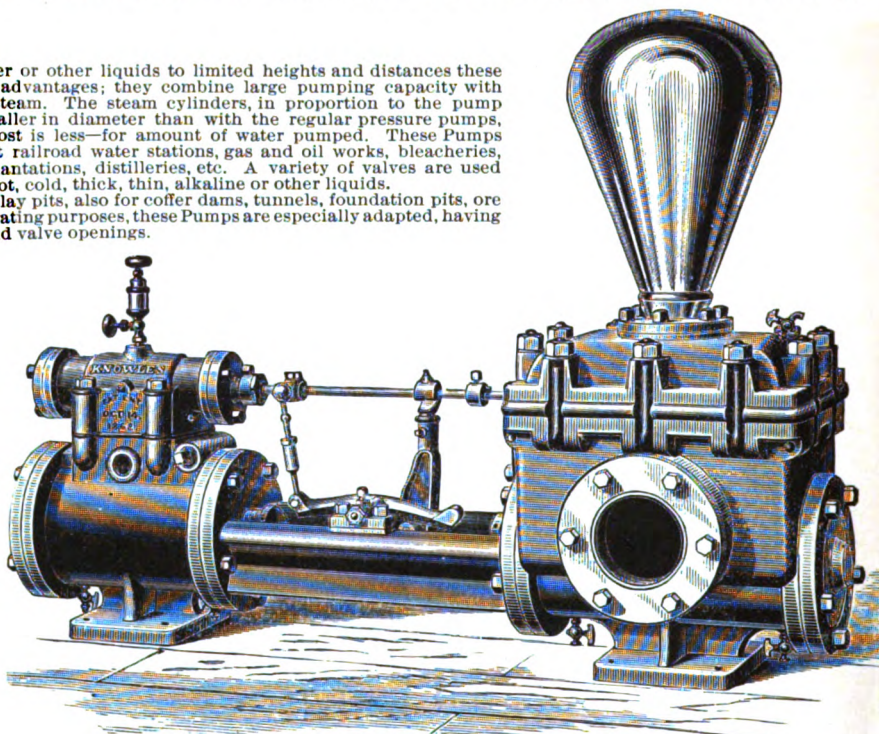
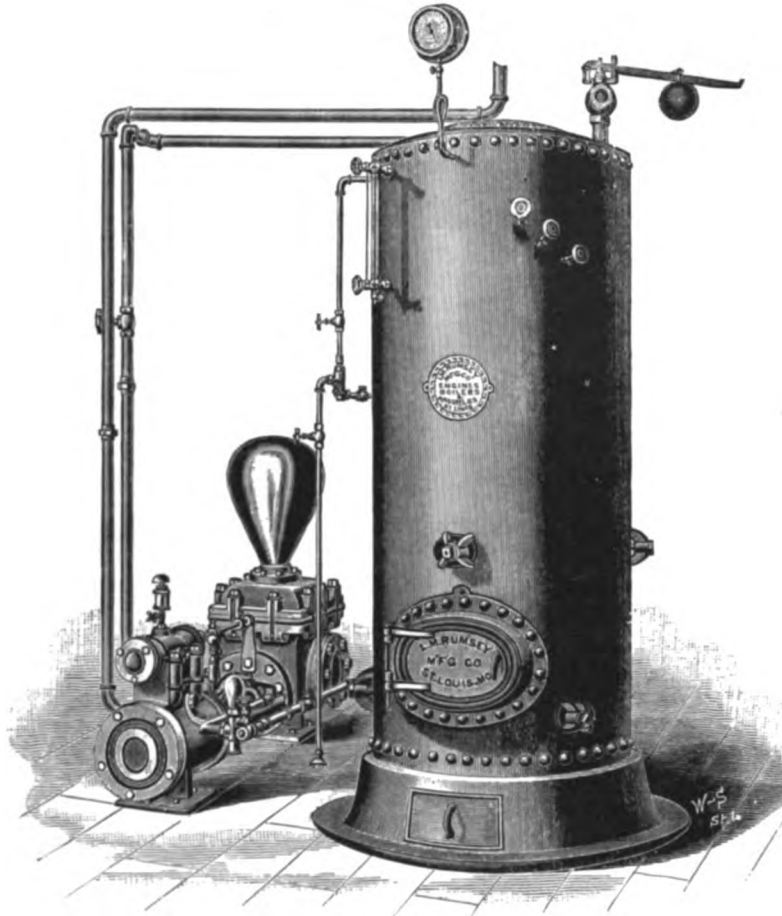


Plate 1178.

Steam Cylin-der, Inches	Water Cylin-der, Inches	Stroke, Inches	Gal-lons per Stroke	Capacity per Minute at Ordinary Speed.	Steam Pipe, Inches	Ex-haust Pipe, Inches	Suc-tion Pipe, Inches	Deliv-ery Pipe, Inches	Floor Space Required, Inches	Price
3 1/4	3 1/4	4	.15	125 Strokes, 18 Gallons	1 1/2	3/4	1 1/2	1 1/4	28 x 10	\$125 00
4	4	5	.27	125 Strokes, 33 Gallons	1 1/2	3/4	2	1 1/2	34 x 11	175 00
5	4	7	.39	125 Strokes, 49 Gallons	1	1	2 1/2	2	34 x 12	238 00
5 1/2	5 1/2	7	.72	125 Strokes, 90 Gallons	1	1	3	2 1/2	44 x 13 1/2	300 00
6	5 1/2	7	.72	125 Strokes, 90 Gallons	1	1	3	2 1/2	44 x 13 1/2	300 00
6	6	12	1.47	100 Strokes, 147 Gallons	1	1	4	4	66 3/4 x 19	350 00
6	7	12	2.00	100 Strokes, 200 Gallons	1	1	5	5	66 3/4 x 19	375 00
7 1/2	7	12	1.66	100 Strokes, 166 Gallons	1	1 1/4	5	5	66 3/4 x 19	375 00
7 1/2	7 1/2	12	1.91	100 Strokes, 191 Gallons	1	1 1/4	5	5	66 3/4 x 19	375 00
8	6	10	1.47	100 Strokes, 147 Gallons	1	1 1/4	4	4	66 3/4 x 19	400 00
8	7	12	2.00	100 Strokes, 200 Gallons	1	1 1/4	5	5	66 3/4 x 19	425 00
8	8	12	2.61	100 Strokes, 261 Gallons	1	1 1/4	5	5	66 3/4 x 20	450 00
8	9	12	3.30	100 Strokes, 330 Gallons	1	1 1/4	6	6	66 3/4 x 21 1/2	475 00
8	10	12	4.08	100 Strokes, 408 Gallons	1	1 1/4	6	6	66 3/4 x 21 1/2	500 00
10	10	12	4.08	100 Strokes, 408 Gallons	1 1/4	1 1/2	6	6	66 3/4 x 21 1/2	550 00
10	10	16	5.44	75 Strokes, 408 Gallons	1 1/4	1 1/2	C	6	78 1/2 x 21 1/2	650 00
10	12	12	5.87	100 Strokes, 587 Gallons	1 1/4	1 1/2	8	6	66 3/4 x 23 3/4	600 00
10	12	16	7.83	75 Strokes, 587 Gallons	1 1/4	1 1/2	8	6	78 1/2 x 23 3/4	.....
12	10	12	4.08	100 Strokes, 408 Gallons	2	2 1/2	6	6	66 3/4 x 21 1/2	.....
12	10	16	5.44	75 Strokes, 408 Gallons	2	2 1/2	6	6	78 1/2 x 21 1/2	.....
12	12	12	5.87	100 Strokes, 587 Gallons	2	2 1/2	8	6	66 3/4 x 23 3/4	.....
12	12	16	7.83	75 Strokes, 587 Gallons	2	2 1/2	8	6	78 1/2 x 23 3/4	.....
14	12	12	5.87	100 Strokes, 587 Gallons	2	2 1/2	8	6	66 3/4 x 23 3/4	.....
14	12	16	7.83	75 Strokes, 587 Gallons	2	2 1/2	8	6	78 1/2 x 23 3/4	.....
14	14	16	10.66	75 Strokes, 800 Gallons	2	2 1/2	10	8	78 1/2 x 27	.....
14	14	24	16.00	50 Strokes, 800 Gallons	2 1/2	3	10	8	108 x 27	.....
14	16	16	14.92	75 Strokes, 1020 Gallons	2 1/2	3	12	10	80 x 35 1/2	.....
14	16	24	20.88	50 Strokes, 1044 Gallons	2 1/2	3	12	10	108 x 35 1/2	.....
16	14	16	10.66	75 Strokes, 800 Gallons	2 1/2	3	10	8	78 1/2 x 27	.....
16	14	24	16.00	50 Strokes, 800 Gallons	2 1/2	3	10	8	108 x 27	.....
16	16	16	14.92	75 Strokes, 1020 Gallons	2 1/2	3	12	10	80 x 35 1/2	.....
16	16	24	20.88	50 Strokes, 1044 Gallons	2 1/2	3	12	10	108 x 35 1/2	.....
16	18	24	26.44	50 Strokes, 1322 Gallons	2 1/2	3	12	10	108 x 38	.....
16	20	24	32.64	50 Strokes, 1632 Gallons	2 1/2	3	14	12	108 x 40	.....
18	16	24	20.88	50 Strokes, 1044 Gallons	3 1/2	4	12	10	110 x 35 1/2	.....
18	18	24	26.44	50 Strokes, 1322 Gallons	3 1/2	4	12	10	110 x 38	.....
18	20	24	32.64	50 Strokes, 1632 Gallons	3 1/2	4	14	12	110 x 40	.....
18	22	24	39.50	50 Strokes, 1975 Gallons	3 1/2	4	14	14	110 x 42	.....
20	18	24	26.44	50 Strokes, 1322 Gallons	3 1/2	4	12	10	118 x 38	.....
20	20	24	32.64	50 Strokes, 1622 Gallons	3 1/2	4	14	12	118 x 40	.....
20	22	24	39.50	50 Strokes, 1975 Gallons	3 1/2	4	14	14	118 x 42	.....
20	24	24	47.00	50 Strokes, 2350 Gallons	3 1/2	4	16	16	118 x 44	.....

Also patterns for larger sizes or other combinations of cylinders.

COMBINED STEAM PUMP AND BOILER.



This combination of Knowles' Improved Steam Pump with Upright Boiler and Fixtures, is the most compact, serviceable and inexpensive machine of its kind for supplying water to hotels, public buildings and residences; also for use in railroad water stations, brick yards, tanneries, quarries, etc.

The attention of railroad officials is particularly called to the especial advantage of this light, portable and convenient pumping apparatus for the water supply of tanks at watering stations.

It does not need a skilled mechanic in setting up or operating it. A person of ordinary intelligence can be taught its management in a few hours' time.

The whole apparatus is of the best manufacture, the boiler being tested to 150 pounds to the square inch. When water is to be forced not higher than 50 to 75 feet, the Tank Pumps are preferable and less expensive.

Fitted with Base, Grates, Gauge Cocks, Steam Gauge, Water Gauge, Safety Valve, Globe Valves, Blow-off Cock, Steam and Exhaust Pipes, Boiler Feed Connection, Valves, Unions and necessary fittings, etc., also with Injector or Auxiliary Boiler Feed Pump, as desired.

Smoke Stacks are not included, but are charged for extra if wanted.

Plate 1179.

BOILER FEEDING OR PRESSURE PUMPS.

No.	Steam Cylinder, Inches	Water Cylinder, Inches	Stroke, Inches	Gallons per Stroke	Capacity per Minute at Ordinary Speed	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Delivery Pipe, Inches	Price, Pump and Boiler, Combined.
000	2½	1½	3	.023	150 strokes, 3½ gals.	1½	¾	1½	¾	\$ 150 00
00	3	1¾	3	.031	150 strokes, 4¾ gals.	1½	¾	1½	¾	165 00
0	3½	2	4	.05	150 strokes, 7½ gals.	1½	¾	1½	1	285 00
1	3½	2½	4	.07	150 strokes, 10½ gals.	1½	¾	1½	1	325 00
2	4	2½	5	.11	150 strokes, 16½ gals.	1½	¾	1½	1	350 00
3	5	3¼	7	.25	125 strokes, 31 gals.	¾	1	2	1½	450 00
4	5½	3¾	7	.34	125 strokes, 42 gals.	¾	1	2	1½	475 00
4½	7	4	7	.39	125 strokes, 49 gals.	1	1½	2½	2	525 00
5	7	4½	10	.69	100 strokes, 69 gals.	1	1½	3	2½	675 00
6	7½	5	10	.85	100 strokes, 85 gals.	1	1½	3	2½	700 00
6½	8	5	12	1.02	100 strokes, 102 gals.	1	1½	4	4	725 00
7	10	6	12	1.47	100 strokes, 147 gals.	1½	1½	4	4	975 00
8	12	7	12	2.00	100 strokes, 200 gals.	2	2½	5	5	1,100 00
9	14	8	12	2.61	100 strokes, 261 gals.	2	2½	5	5	.....

LIGHT SERVICE OR TANK PUMPS.

.....	4	4	5	.27	125 strokes, 33 gals.	1½	¾	2	1½	\$ 375 00
.....	5½	5½	7	.72	125 strokes, 90 gals.	¾	1	3	2½	525 00
.....	6	6	12	1.46	100 strokes, 146 gals.	¾	1	4	4	675 00
.....	7½	7½	10	1.90	100 strokes, 190 gals.	1	1½	5	5	700 00
.....	8	8	12	2.65	100 strokes, 265 gals.	1	1½	5	5	775 00
.....	10	10	12	4.00	100 strokes, 400 gals.	1½	1½	6	6	1,075 00
.....	10	10	16	5.40	75 strokes, 405 gals.	1½	1½	6	6	1,225 00

Larger Sizes, with Upright, Horizontal or Locomotive Boilers, to order.

KNOWLES' PATENT MINING PUMP.

REGULAR PISTON PATTERN.

Our experience in building Pumps for mines in all parts of the world has proved that no one form of pumping engine can fully meet the requirements of mines in different sections, or of those in the same locality working under different conditions. Consequently we have, at great expense, designed and constructed the several different styles which we fully describe in this catalogue, believing that they fully cover the requirements of the various mines.

The table on the following page gives the principal sizes of the three standard types of our Horizontal Mining Pumps.

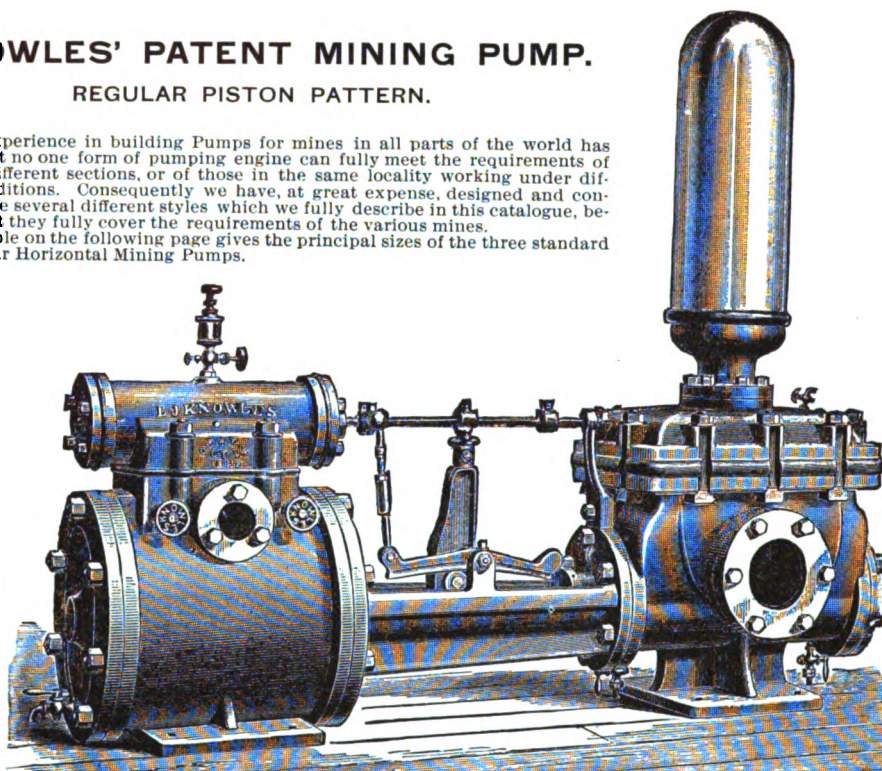


Plate 1180.

KNOWLES' PLUNGER MINING PUMP.

PATENT SOLID CYLINDER PATTERN.

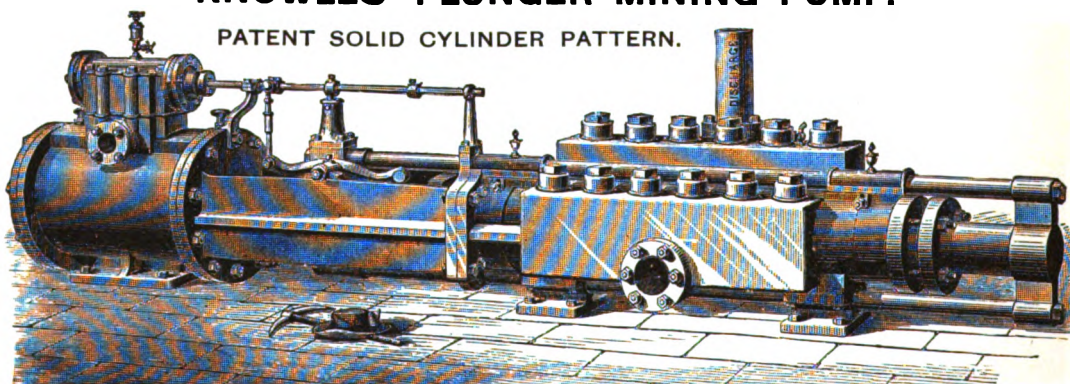


Plate 1181.

KNOWLES' PLUNGER MINING PUMP.

PATENT POT-VALVE PATTERN.

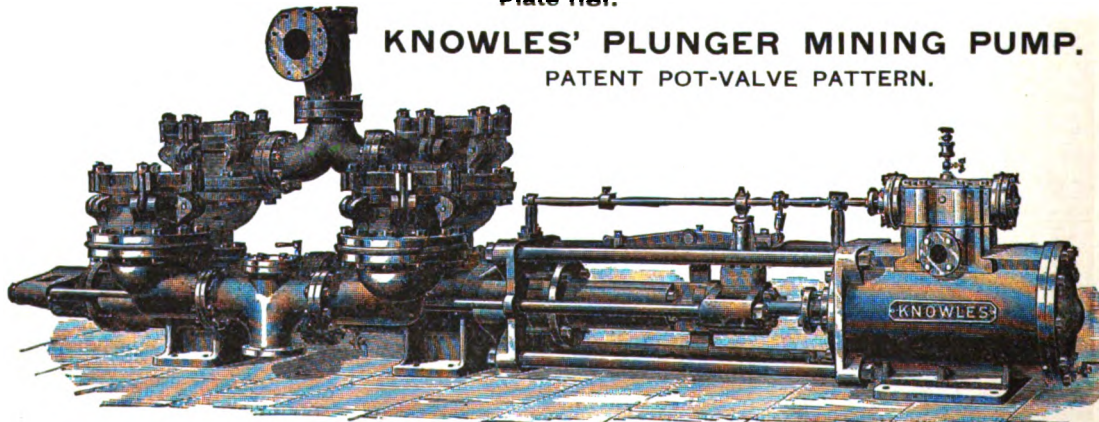


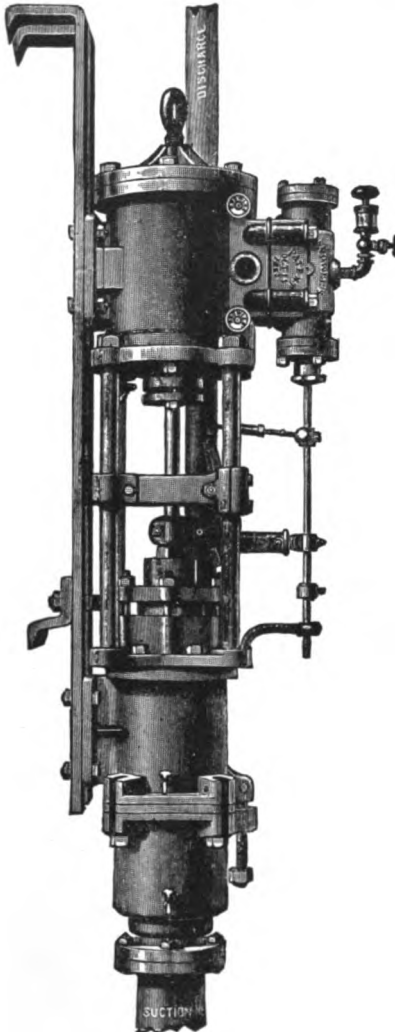
Plate 1182.

KNOWLES' PATENT MINING PUMPS.—CONTINUED.**TABLE OF SIZES, CAPACITIES AND PRICES.**

Steam Cylinder, Inches	Water Cyl'r or Plung'rs Inches	Stroke, Inches	Gallons per Stroke	Capacity per Minute at Ordinary Speed	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Delivery Pipe, Inches	Prices Piston Pumps		Prices Plunger Pumps
									Reg'lar Pattern	Remov- able Cyl. Pattern	
6	8	7	.22	125 Strokes, 28 gallons	3/4	1	2	1 1/2	\$200	\$225	\$275
6	8 3/4	7	.34	125 Strokes, 42 gallons	3/4	1	2	1 1/2	225	250	300
7 1/2	8 3/4	10	.36	100 Strokes, 36 gallons	1	1 1/4	2	1 1/2	300	350	400
7 1/2	8 3/4	10	.47	100 Strokes, 47 gallons	1	1 1/4	2 1/2	2	325	375	425
7 1/2	4 1/2	10	.69	100 Strokes, 69 gallons	1	1 1/4	3	2 1/2	350	400	450
8	4	12	.65	100 Strokes, 65 gallons	1	1 1/4	3	2 1/2	375	440	475
8	4 1/2	12	.82	100 Strokes, 82 gallons	1	1 1/4	3	2 1/2	375	440	500
8	5	10	.85	100 Strokes, 85 gallons	1	1 1/4	3	2 1/2	375	440	475
8	5	12	1.02	100 Strokes, 102 gallons	1	1 1/4	4	4	400	475	500
10	4	12	.65	100 Strokes, 65 gallons	1 1/4	1 1/2	4	4	425	500	525
10	4 1/2	12	.82	100 Strokes, 82 gallons	1 1/4	1 1/2	4	4	425	500	550
10	5	12	1.02	100 Strokes, 102 gallons	1 1/4	1 1/2	4	4	425	500	550
10	6	12	1.47	100 Strokes, 147 gallons	1 1/4	1 1/2	4	4	450	525	600
12	5	12	1.02	100 Strokes, 102 gallons	2	2 1/2	4	4	500	575	625
12	6	12	1.47	100 Strokes, 147 gallons	2	2 1/2	4	4	500	575	650
12	7	12	2.00	100 Strokes, 200 gallons	2	2 1/2	5	5	525	625	700
12	8	12	2.61	100 Strokes, 261 gallons	2	2 1/2	5	5			
14	5	12	1.02	100 Strokes, 102 gallons	2 1/2	3	4	4			
14	6	12	1.47	100 Strokes, 147 gallons	2 1/2	3	4	4			
14	7	12	2.00	100 Strokes, 200 gallons	2 1/2	3	5	5			
14	7	16	2.67	75 Strokes, 200 gallons	2 1/2	3	5	5			
14	8	12	2.61	100 Strokes, 261 gallons	2 1/2	3	5	5			
14	8	16	3.48	75 Strokes, 263 gallons	2 1/2	3	5	5			
16	7	16	2.67	75 Strokes, 200 gallons	2 1/2	3	5	5			
16	7	24	4.00	50 Strokes, 200 gallons	2 1/2	3	5	5			
16	8	16	3.48	75 Strokes, 263 gallons	2 1/2	3	5	5			
16	8	24	5.22	50 Strokes, 263 gallons	2 1/2	3	5	5			
16	9	16	4.44	75 Strokes, 332 gallons	2 1/2	3	6	6			
16	9	24	6.60	50 Strokes, 332 gallons	2 1/2	3	6	6			
16	10	16	5.33	75 Strokes, 410 gallons	2 1/2	3	6	6			
16	10	24	8.16	50 Strokes, 410 gallons	2 1/2	3	10	8			
18	8	16	3.48	75 Strokes, 263 gallons	2 1/2	3	5	5			
18	8	24	5.22	50 Strokes, 263 gallons	2 1/2	3	5	5			
18	9	16	4.44	75 Strokes, 332 gallons	2 1/2	3	6	6			
18	9	24	6.60	50 Strokes, 332 gallons	2 1/2	3	6	6			
18	10	16	5.33	69 Strokes, 368 gallons	2 1/2	3	6	6			
18	10	24	8.16	45 Strokes, 368 gallons	2 1/2	3	10	8			
18	10	36	12.24	30 Strokes, 368 gallons	3 1/2	4	10	8			
18	12	24	11.75	45 Strokes, 529 gallons	3 1/2	4	10	8			
18	12	36	17.63	30 Strokes, 529 gallons	3 1/2	4	12	10			
18	14	24	16.00	45 Strokes, 720 gallons	3 1/2	4	12	10			
18	14	36	24.00	30 Strokes, 720 gallons	3 1/2	4	12	10			
20	8	16	3.48	75 Strokes, 263 gallons	3 1/2	4	5	5			
20	8	24	5.22	50 Strokes, 263 gallons	3 1/2	4	5	5			
20	9	16	4.44	75 Strokes, 332 gallons	3 1/2	4	6	6			
20	9	24	6.60	50 Strokes, 332 gallons	3 1/2	4	6	6			
20	9	36	9.92	34 Strokes, 332 gallons	3 1/2	4	6	6			
20	10	16	5.33	60 Strokes, 368 gallons	3 1/2	4	6	6			
20	10	24	8.16	45 Strokes, 368 gallons	3 1/2	4	10	8			
20	10	36	12.24	30 Strokes, 368 gallons	3 1/2	4	10	8			
20	12	24	11.75	45 Strokes, 529 gallons	3 1/2	4	10	8			
20	12	36	17.63	30 Strokes, 529 gallons	3 1/2	4	12	10			
20	14	24	16.00	45 Strokes, 720 gallons	3 1/2	4	12	10			
20	14	36	24.00	30 Strokes, 720 gallons	3 1/2	4	12	10			
24	9	24	6.60	50 Strokes, 332 gallons	4	4 1/2	6	6			
24	9	36	9.92	34 Strokes, 332 gallons	4	4 1/2	6	6			
24	10	24	8.16	45 Strokes, 368 gallons	4	4 1/2	10	8			
24	10	36	12.24	30 Strokes, 368 gallons	4	4 1/2	10	8			
24	12	24	11.75	45 Strokes, 529 gallons	4	4 1/2	10	8			
24	12	36	17.63	30 Strokes, 529 gallons	4	4 1/2	12	10			
24	14	24	16.00	45 Strokes, 720 gallons	4	4 1/2	12	10			
24	14	36	24.00	30 Strokes, 720 gallons	4	4 1/2	12	10			
24	16	24	20.88	45 Strokes, 940 gallons	4	4 1/2	14	12			
24	16	36	31.32	30 Strokes, 940 gallons	4	4 1/2	14	12			
28	10	24	8.16	45 Strokes, 368 gallons	5	6	10	8			
28	10	36	12.24	30 Strokes, 368 gallons	5	6	10	8			
28	12	24	11.75	45 Strokes, 529 gallons	5	6	10	8			
28	12	36	17.63	30 Strokes, 529 gallons	5	6	12	10			
28	14	24	16.00	45 Strokes, 720 gallons	5	6	12	10			
28	14	36	24.00	30 Strokes, 720 gallons	5	6	12	10			
28	16	24	20.88	45 Strokes, 940 gallons	5	6	14	12			
28	16	36	31.32	30 Strokes, 940 gallons	5	6	14	12			
30	10	24	8.16	45 Strokes, 368 gallons	5	6	10	8			
30	10	36	12.24	30 Strokes, 368 gallons	5	6	10	8			
30	12	24	11.75	45 Strokes, 529 gallons	5	6	10	8			
30	12	36	17.63	30 Strokes, 529 gallons	5	6	12	10			
30	14	24	16.00	45 Strokes, 720 gallons	5	6	12	10			
30	14	36	24.00	30 Strokes, 720 gallons	5	6	12	10			
30	16	24	20.88	45 Strokes, 940 gallons	5	6	14	12			
30	16	36	31.32	30 Strokes, 940 gallons	5	6	14	12			
30	18	24	26.44	45 Strokes, 1190 gallons	5	6	16	14			
30	18	36	39.66	30 Strokes, 1190 gallons	5	6	16	14			

Also Patterns for larger sizes and other combinations of Cylinders.

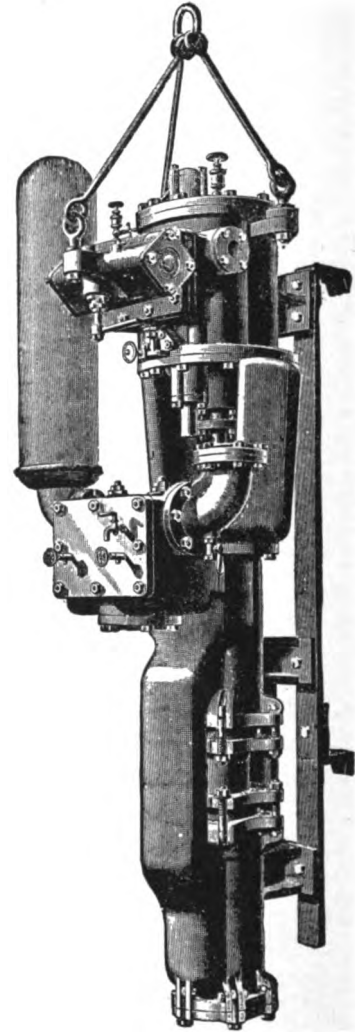
In ordering, purchasers should be specific in giving information as to the conditions under which the Pumps are to operate, that we may be able to do full justice to ourselves and give entire satisfaction. They should also state whether the water is clear or gritty, and particularly if it is impregnated with sulphurous or other corroding acids. If it is necessary to arrange the Pumps with Gun-Metal Composition Water Cylinders we have special patterns for this purpose, charging only for the additional cost of the composition metal.

KNOWLES' IMPROVED MINE SINKING PUMPS.**KNOWLES' PATENT VERTICAL SINKING PUMP.****OUTSIDE PACKED PLUNGER PATTERN.****Plate 1183.**

In this type of pump a hard iron plunger moves in two working barrels having stuffing-boxes and glands fitted with swing bolts for convenience in packing. The valves are of medium hard rubber, with brass seats, bolts and springs, the valve chamber being independent and easily removable for inspection or repairs. The suction valve chamber is fitted with automatic air valves for relieving the pump of air, and the discharge air chamber has a cock for the same purpose. The discharge elbow is fitted with a standard flange and has a cock for drawing off the water in discharge pipe when desired. The bottom flange of the lower working barrel has swing bolts for convenience of removal in order to take out sand or gravel, and the discharge air chamber is in one piece, securing compactness and minimum weight.

The steam cylinder has a recently improved valve gear, without external moving parts, thus reducing the liability to injury from accident or rough usage. The entire design of this pump is exceptionally strong and compact. Workmanship and materials are of the best and fully warranted in every respect.

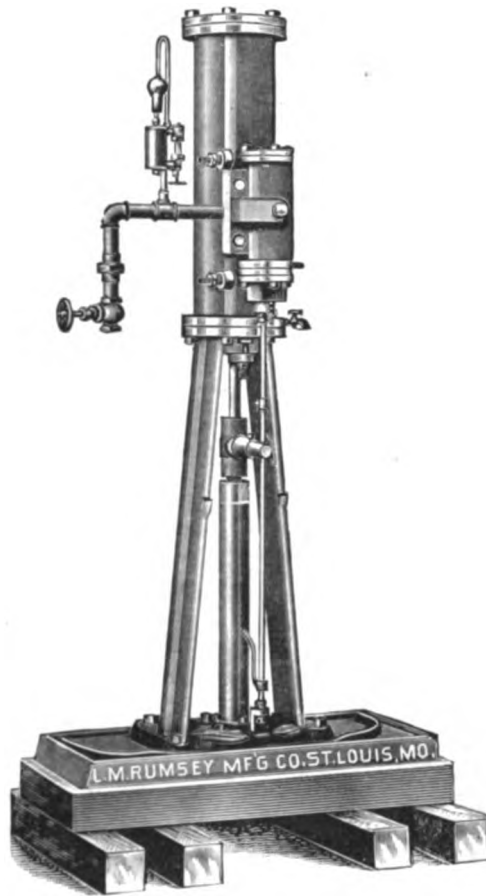
Send for the Knowles General Catalogue.

**Plate 1184.**

Diameter of Steam Cylinder	Diameter of Plungers	Stroke	Gallons per Stroke	*Capacity per Minute, Gallons	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Dimensions Over All	Weight	Price
8	4	10	.54	65	1	1½	3½	2½	74 x 25 x 27½	1,200	.....
8	4½	10	.69	80	1	1½	4	3	83¼ x 25 x 31¼	1,200	.....
10	3¾	10	.48	40	1½	2	3½	2½	79½ x 28½ x 27½	1,400	.....
10	3¾	12	.57	45	1½	2	3½	2½	86 x 28½ x 27½	1,450	.....
10	4½	12	.83	85	1½	2	4	3	88 x 28½ x 31¼	1,800	.....
10	5	12	1.02	100	1½	2	4	3	88 x 28½ x 31¼	1,900	.....
12	6	12	1.47	150	1½	2½	5	4	98 x 32½ x 36½	2,450	.....
12	7	14	2.33	200	1½	2½	5	4	108 x 34½ x 39½	3,500	.....
14	7	14	2.33	200	2	3	5	4	112¾ x 38½ x 39½	4,150	.....
16	8	16	3.48	300	2½	4	6	5	124 x 44 x 43	4,700	.....
18	9	16	4.41	330	3	4	6	5	126 x 46 x 45	6,500	.....
16 x 16†	11	20	8.23	500	3	5	8	7	176¼ x 40½ x 38½	10,800	.....
16 x 16†	12	20	9.79	600	3	5	8	7	176¼ x 40½ x 38½	10,800	.....

*Capacities given are for a piston speed of about 100 feet per minute. This may be doubled in an emergency, but we do not recommend exceeding it for continuous service.

†These pumps have two steam cylinders placed tandem on the same rod, and taking steam at full pressure.

RUMSEY ARTESIAN PUMPING ENGINE.**Plate 1185.**

Suitable for water works, breweries, manufactories, dairies, elevators and domestic uses, pumping the smallest or the largest well. With our patented improvements deep wells can be practically pumped. Is suitable for railroad water station work, rolling mills, mines, etc., where skillful men are not always employed for operating engines.

Notice.—This overcomes the difficulty of going into a dangerous well, as it is wholly repaired on the top of the ground.

Cut shows the Engine ready for work, as when connected to the water cylinder.

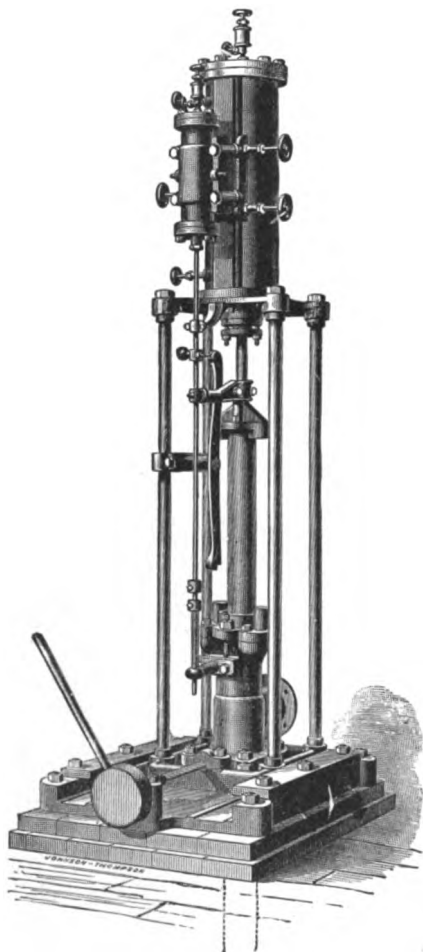
To remove the rods and the valves from the well, first loosen the stuffing box, raise it on the large piston and put on the clamp, driving out the key which holds the well rods to the piston of the Engine, take out three bolts on base, loosen the fourth bolt, so that the Engine may be swung around, and the rods may be removed from the well by the use of block and falls, which can be connected to any firm support above. By removing the lower cap of the small auxiliary cylinder, all the valves are reached.

Number	1	2	3	4	5	6	7
Size Cylinder	4x12	4x16	4x20	5x24	6x24	6x36	8x24
Shipping wt., lbs. . . . .	.....	.....	.....	800	900	1000	1200
Price	\$100 00	125 00	150 00	190 00	235 00	275 00	300 00
Air Chamber	8 00	8 00	8 00	10 00	12 00	12 00	14 00
Number	8	9	10	11	12	13	14
Size Cylinder	8x36	10x24	10x36	12x24	12x36	14x36	16x36
Shipping wt., lbs.	1450	1450	1800	1950	2400	2800	3500
Price	\$330 00	340 00	380 00	450 00	500 00	750 00	1000 00
Air Chamber	14 00	14 00	14 00	16 00	16 00	20 00	25 00

In ordering Pump, give us the following information: Size of well and depth. Depth of the casing in the well, and the kind. How near the water stands from the surface. The amount of water required in a given time. Do you find water in gravel, sand or earthy materials? Have you boiler, and if so, give the size and pressure steam carried.

KNOWLES' PATENT ARTESIAN WELL PUMP.

VERTICAL BUCKET-PLUNGER PATTERN.



This improved form of the Knowles' Vertical Steam Pump is especially designed for non-flowing Artesian or bored wells, and for driven pipe wells, where the water fails to rise within drafting distance (say 25 feet) of the surface. These Pumps are much simpler, less expensive, and not so liable to get out of order as the more complicated and cumbersome working-beam or rotative pumps. They will pump from the deepest wells (2000 feet if desired) and deliver a steady stream of water (or oil) to any point.

Above are given two views, i. e., the steam end, as it appears in position at the mouth of well, and the working barrel, or pump end, located at the bottom. This latter is a casting of the hardest composition (not soft brass tubing) and is carefully bored out and fitted with pump bucket and foot valve. It is screwed on the lower end of the well piping through which the pump rod works. The pump rod connection between the pump bucket and the upper plunger is made of wood or extra heavy iron pipe. The action of the pump is fully controlled by a perfected arrangement of steam valves, making the up and down strokes equally uniform and regular. The pump bucket discharges water on the up stroke and the upper plunger discharges on the down stroke, consequently the flow of water is steady and continuous. The pump bucket and foot valve are of special construction, and can be readily drawn up through the well piping for examination or repairs.



Plate 1186.

Steam Cylinder, Inches	Bucket, Inches	Plunger, Inches	Stroke, Inches	Steam Pipe, Inches	Exhaust Pipe, Inches	Price	Capacity at 100 Feet Piston Travel
4	2 $\frac{3}{4}$ to 3 $\frac{1}{4}$	1 $\frac{7}{8}$ to 2 $\frac{3}{8}$	7	$\frac{1}{2}$	$\frac{3}{4}$	.....	.....
6	2 $\frac{3}{4}$ to 4 $\frac{1}{4}$	1 $\frac{7}{8}$ to 3	12	$\frac{3}{4}$	1	.....	.....
8	3 $\frac{1}{4}$ to 5 $\frac{3}{4}$	2 $\frac{3}{8}$ to 4	24	1	1 $\frac{1}{4}$	.....	.....
10	3 $\frac{1}{4}$ to 8 $\frac{1}{2}$	2 $\frac{3}{8}$ to 6	24	1 $\frac{1}{4}$	2	.....	.....
12	3 $\frac{1}{4}$ to 8 $\frac{1}{2}$	2 $\frac{3}{8}$ to 6	24	1 $\frac{1}{2}$	2 $\frac{1}{2}$	.....	.....
14	3 $\frac{3}{4}$ to 8 $\frac{1}{2}$	2 $\frac{3}{8}$ to 6	24	2	3	.....	.....
16	3 $\frac{3}{4}$ to 8 $\frac{1}{2}$	2 $\frac{3}{8}$ to 6	24	2	3	.....	.....

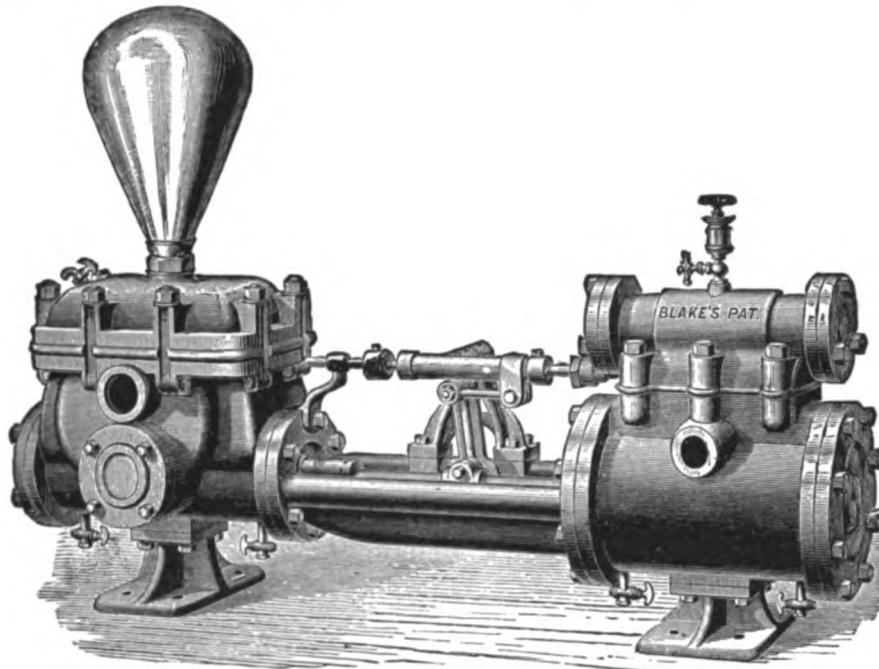
Also patterns for larger sizes and other combinations.

The steam end is arranged to slide to one side upon the bed plate, which feature is very convenient when it is necessary to pull out the pump rods or take up the well piping.

5 in. Well will take 3 in. Pipe and 2 $\frac{1}{4}$ in. Bucket, or 3 $\frac{1}{2}$ in. Flush Joint Pipe and 3 $\frac{1}{4}$ in. Bucket.
5 $\frac{1}{2}$ in. Well will take 3 $\frac{1}{2}$ in. Pipe and 3 $\frac{1}{4}$ in. Bucket, or 4 in. Flush Joint Pipe and 3 $\frac{3}{4}$ in. Bucket.
6 in. Well will take 4 in. Pipe and 3 $\frac{3}{4}$ in. Bucket, or 4 $\frac{1}{2}$ in. Flush Joint Pipe and 4 $\frac{1}{4}$ in. Bucket.
6 $\frac{1}{2}$ in. Well will take 4 $\frac{1}{2}$ in. Pipe and 4 $\frac{1}{4}$ in. Bucket, or 5 in. Flush Joint Pipe and 4 $\frac{3}{4}$ in. Bucket.
7 $\frac{1}{2}$ in. Well will take 5 in. Pipe and 4 $\frac{3}{4}$ in. Bucket, or 6 in. Flush Joint Pipe and 5 $\frac{3}{4}$ in. Bucket.
8 in. Well will take 6 in. Pipe and 5 $\frac{3}{4}$ in. Bucket, or 7 in. Flush Joint Pipe and 6 $\frac{3}{4}$ in. Bucket.
9 in. Well will take 7 in. Pipe and 6 $\frac{3}{4}$ in. Bucket, or ... in. Flush Joint Pipe and ... in. Bucket.
10 in. Well will take 8 in. Pipe and 7 $\frac{3}{8}$ in. Bucket, or ... in. Flush Joint Pipe and ... in. Bucket.
12 in. Well will take 9 in. Pipe and 8 $\frac{1}{2}$ in. Bucket, or 10 in. Flush Joint Pipe and 9 $\frac{1}{2}$ in. Bucket.

Regular piping is more durable than Flush Joint piping; the latter, however, being of less diameter outside admits of the use of larger pump buckets and consequently increased pumping capacity.

Flush Joint pipe is regular standard wrought iron pipe, without the usual couplings, it has one end of each length bored and tapped—the other end is turned off and threaded. Where it is possible always use regular standard pipe in preference to Flush Joint pipe or well casing.

BLAKE'S IMPROVED PUMPS.**IMPROVED BOILER FEED OR PRESSURE PUMP, WITH NEW VALVE MOTION.****Plate 1187.**

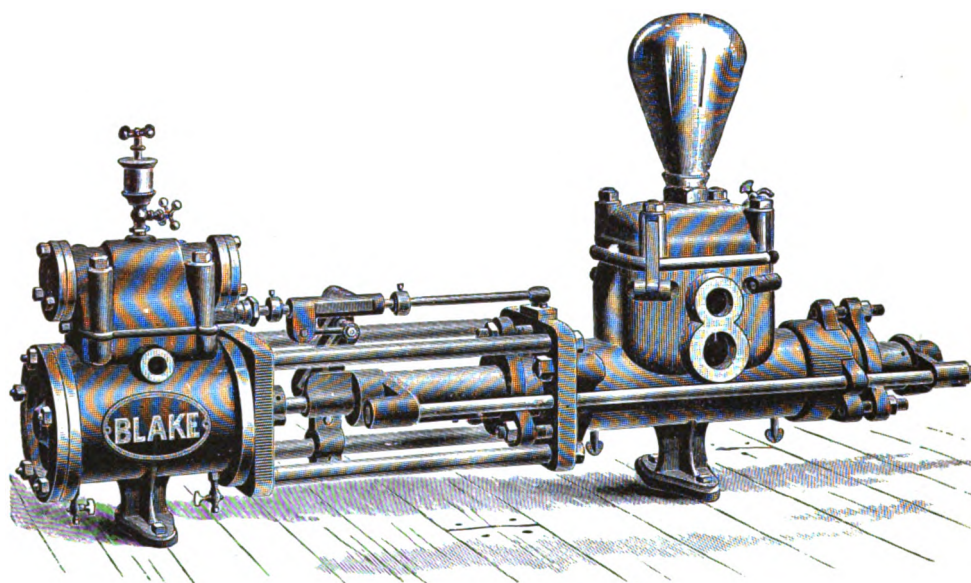
As Boiler feeders these pumps possess important advantages, enabling them to be regulated in speed, to supply the exact amount of water evaporated. Practical tests have demonstrated that these pumps effect a great saving of fuel over Injectors and similar Boiler-feeding devices; their superior reliability has never been questioned. They are constructed with Composition Piston Rods, Stuffing Boxes, Valve Seats, Valve Bolts and Pump Cylinder Linings. The Water Pistons are also made of composition, and are suitably packed with adjustable fibrous packing, adapted for hot or cold liquids. All parts are interchangeable, and can therefore be readily duplicated in case of accidental breakage or unusual wear. These pumps have large direct water passages, and full Valve areas, which not only reduce water friction to a minimum, but also enable them to be run at a speed that makes them efficient Fire Pumps.

Number	Steam Cylinder, Inches	Water Cylinder, Inches	Stroke, Inches	Gallons per Stroke	*Capacity per Minute at Speed Stated	Steam Pipe, Inches	Exhaust Pipe, Inches	Suction Pipe, Inches	Delivery Pipe, Inches	Floor Space Required, Inches	Weight about Lbs.	Price
000	2 1/2	1 1/2	3	.023	150 strokes, 3 1/2 gals.	1 1/4	3/8	1 1/2	3/8	17 x 5	30	\$ 40 00
00	3	1 3/4	3	.031	150 strokes, 4 3/4 gals.	1 1/4	3/8	1 1/2	3/8	18 x 5	35	55 00
0	3 1/2	2 1/8	4	.04	150 strokes, 8 1/2 gals.	1 1/4	1 1/2	1	3/4	24 x 6	115	85 00
1 1/2	4	2 3/8	5	.10	150 strokes, 15 gals.	1 1/2	3/4	1 1/4	1	37 x 8	275	125 00
2 1/2	4 1/2	2 3/4	6	.15	150 strokes, 22 gals.	1 1/2	3/4	1 1/4	1	37 x 8	300	150 00
3	5 1/2	3 1/4	7	.25	125 strokes, 31 gals.	1 1/2	3/4	1 1/2	1 1/4	41 x 9	360	200 00
4	6	3 3/4	7	.33	125 strokes, 42 gals.	3/4	1	2	1 1/2	41 x 10	400	225 00
4 1/2	6 1/2	4 1/8	8	.46	125 strokes, 58 gals.	1 1/4	1 1/4	2 1/2	2	48 x 10	550	275 00
5	7 1/4	4 1/2	10	.69	100 strokes, 69 gals.	1 1/2	2 1/2	2	2	52 x 11	600	350 00
6	8	5	10	.85	100 strokes, 85 gals.	1	1 1/2	3	2 1/2	53 x 12	750	375 00
6 1/2	8	5	12	1.02	100 strokes, 102 gals.	1	1 1/2	3 1/2	3	64 x 15	1,050	400 00
7	10	6	12	1.47	100 strokes, 147 gals.	1 1/4	2	3 1/2	3	66 x 15	1,325	450 00
8	12	7	12	2.00	100 strokes, 200 gals.	1 1/2	2 1/2	5	4	66 x 16	1,500	525 00
9	14	8	12	2.61	100 strokes, 261 gals.	2	3	5	4	66 x 18	1,825	600 00
10	16	9	18	4.96	70 strokes, 347 gals.	2	3	8	6	98 x 28	4,150	Prices on applica- tion
10 1/2	16	10	24	8.16	50 strokes, 408 gals.	2	3	8	6	116 x 28	5,500	
11	18	12	24	11.75	50 strokes, 588 gals.	2 1/2	3 1/2	10	8	125 x 28	6,500	
12	20	14	24	16.00	50 strokes, 800 gals.	3	4	10	8	125 x 28	8,000	

With Hand Power Attach.

*Twice the above capacities can be had in emergencies; but for continuous work, such as Boiler-feeding, we advise about half the speeds stated. Larger sizes to order. Every pump has suction and delivery openings on both sides; consequently, connections can be made on either side desired. When ordering a pump, please answer the following questions: 1st, Whether for hot or cold water? 2d, What is the vertical lift of suction? 3d, Length of Suction Pipe? 4th, Against what pressure or what is the vertical height to which water is to be forced? 5th, What is the length of Discharge Pipe? 6th, Amount of water needed per hour?

The utility of our Patent Hand Power Attachment will be seen at once, as the pump can be used when steam is down. The Hand Lever can be instantly removed by simply lifting it from the pin on which it rests.

BLAKE'S IMPROVED PLUNGER PUMPS.**DOUBLE ACTING.****FOR FEEDING BOILERS, PUMPING GRITTY WATER, ETC.****Plate 1188.**

These pumps are especially designed for feeding boilers under the higher range of steam pressures, and are adapted for either hot or cold water. They are very efficient, and on the heaviest duty will do greater service than any other class of pumps. They are extensively used in rolling mills, blast furnaces, etc., and are fast superseding the expensive, cumbersome and complicated apparatus known as "doctors" so commonly in use for feeding boilers on the steamboats of the Western and Southern rivers. They are also adapted for pumping gritty or muddy water from wells, pits, quarries, and similar places.

For compactness of design, strength of parts, smooth and steady action, the Blake Plunger Pumps are unexcelled. The piston rods do not enter the pump cylinders, and are therefore not exposed to the action of the water. The plungers are connected by strong side rods and cross heads. The water valve seats and bolts are made of the best gun metal composition and of the most approved form. Valves of rubber or composition are used according to circumstances.

Number	Steam Cylinder	Water Plungers	Stroke	Gallons per Stroke	Capacity per Minute at Ordinary Speed.	Steam Pipe	Exhaust Pipe	Suction Pipe	Delivery Pipe	Floor Space Required	Price
1½	4	2¾	5	.10	150 Strokes, 15 Gals.	½	¾	1¼	1	55 x 8	\$175 00
2½	4½	2¾	6	.15	150 Strokes, 22 Gals.	½	¾	1¼	1	56 x 8	200 00
3	5½	3¼	7	.25	125 Strokes, 31 Gals.	½	¾	1½	1¼	68 x 11	275 00
4	6	3¾	7	.33	125 Strokes, 42 Gals.	¾	1	2	1½	68 x 11	300 00
4½	6½	4¼	8	.46	125 Strokes, 58 Gals.	¾	1¼	2½	2	71 x 14	350 00
5	7¼	4½	10	.69	100 Strokes, 69 Gals.	1	1½	2½	2	99 x 14	450 00
6	8	5	10	.85	100 Strokes, 85 Gals.	1	1½	3	2½	119 x 14	475 00
6½	8	5	12	1.02	100 Strokes, 102 Gals.	1	1½	3½	3	121 x 14	500 00
7	10	6	12	1.47	100 Strokes, 147 Gals.	1¼	2	3½	3	134 x 17	600 00
8	12	7	12	2.00	100 Strokes, 200 Gals.	1½	2½	5	4	135 x 19	.....
9	14	8	12	2.61	100 Strokes, 261 Gals.	2	3	5	4	136 x 21	.....
10	16	9	18	4.96	67 Strokes, 332 Gals.	2	3	8	6	.....	.....

All the working parts of these pumps, as all the Blake Steam Pumps, are made to gauge, and are therefore interchangeable.

Duplicate parts can be quickly substituted when old parts are worn or broken.

Gun metal composition of the best quality is used for such parts as are liable to be affected by bad water, and no expense or pains are spared to make these pumps strong, reliable and durable.

BLAKE'S IMPROVED TANK OR LIGHT SERVICE PUMP.

For light service, such as elevating water and other liquids short distances and to limited heights, these pumps are both economical and effective. They combine large pumping capacity with small expenditure of steam—the cylinders being proportioned accordingly. They are principally used at railroad water stations, reservoirs, gas and oil works, bleacheries, tanneries, refineries, plantations, distilleries, chemical works, etc.

We use a variety of valves in these pumps suitable for pumping hot or cold, thin or thick, alkaline or acid liquids, varying in gravity from alcohol to white lead.

For quarries and clay pits, also for coffer dams, tunnels, foundation pits, ore beds, sewerage and irrigating purposes, these pumps are especially adapted, having large water passages and valve openings.

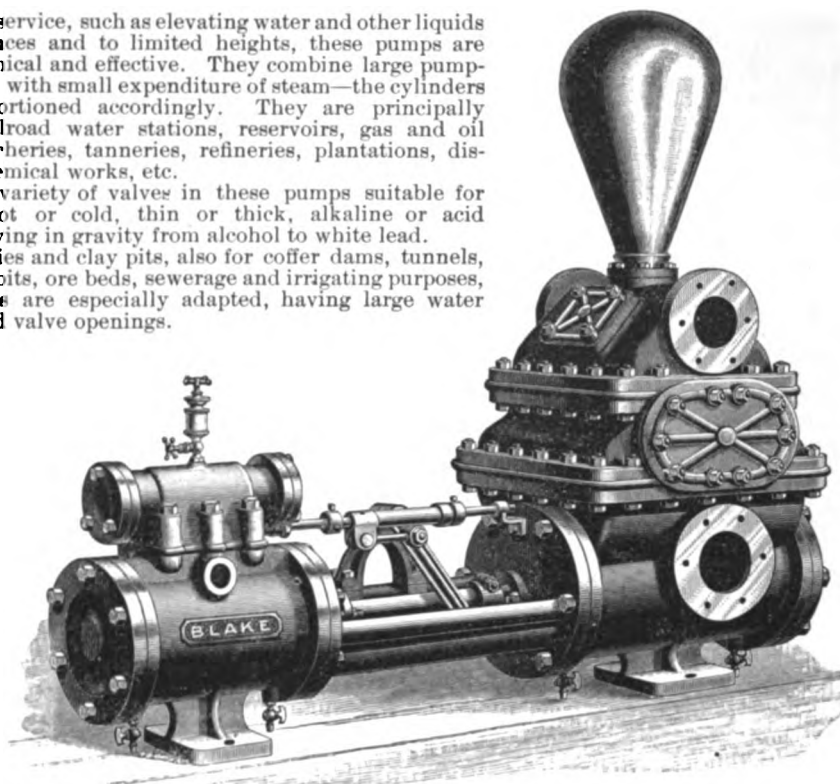


Plate 1189.

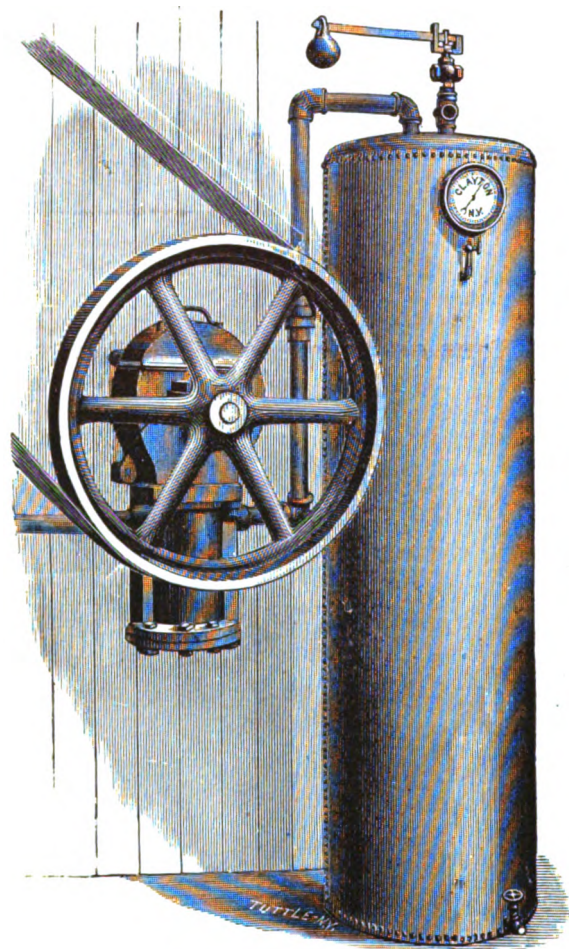
Size	Steam Cylin-der	Water Cylin-der	Stroke	Gallons per Stroke	Capacity per Minute at Ordinary Speed	Steam Pipe	Ex-haust Pipe	Suc-tion Pipe	Deliv-ery Pipe	Floor Space Required	Price
A*	3 1/2	3 1/2	4	.16	125 Strokes, 20 Gals.	3/8	1/2	1 1/2	1	30 x 8	\$125 00
A	4 1/2	3 3/4	6	.24	125 Strokes, 30 Gals.	1/2	3/4	2	1 1/2	37 x 10	175 00
AA	4 1/2	4 1/8	6	.34	125 Strokes, 42 Gals.	1/2	3/4	2	1 1/2	37 x 10	200 00
AAA	5 1/2	4 1/8	7	.42	125 Strokes, 53 Gals.	1/2	3/4	2 1/2	2	46 x 11	250 00
B	6	5 1/2	7	.72	125 Strokes, 90 Gals.	3/4	1	3 1/2	2 1/2	46 x 13	300 00
BB	6	6	12	1.47	100 Strokes, 147 Gals.	3/4	1	3 1/2	2	61 x 16	350 00
BBB	6	7	12	2.00	100 Strokes, 200 Gals.	3/4	1	4	3	65 x 18	375 00
C	7 1/4	7	10	1.66	100 Strokes, 166 Gals.	1	1 1/2	4	3	53 x 16	375 00
CC	8	8	12	1.47	100 Strokes, 147 Gals.	1	1 1/2	3 1/2	3	64 x 16	400 00
CCC	8	7	12	2.00	100 Strokes, 200 Gals.	1	1 1/2	5	4	60 x 16	425 00
D	8	8	12	2.61	100 Strokes, 261 Gals.	1	1 1/2	5	4	60 x 16	450 00
E	8	9	12	3.30	100 Strokes, 330 Gals.	1	1 1/2	6	4	65 x 18	475 00
F	8	10	12	4.08	100 Strokes, 408 Gals.	1	1 1/2	6	4	65 x 18	500 00
FF	10	9	18	4.96	70 Strokes, 347 Gals.	1 1/4	2	8	6	91 x 24	650 00
G	10	10	12	4.08	100 Strokes, 408 Gals.	1 1/4	2	6	4	66 x 19	550 00
GG	10	10	18	6.12	70 Strokes, 428 Gals.	1 1/4	2	8	6	91 x 24	675 00
H	10	12	12	5.87	100 Strokes, 587 Gals.	1 1/4	2	8	6	66 x 21	600 00
HH	10	12	18	8.80	70 Strokes, 616 Gals.	1 1/4	2	8	6	96 x 24	700 00
HI	12	10	12	4.08	100 Strokes, 408 Gals.	1 1/2	2 1/2	6	4	67 x 19	600 00
IH	12	10	18	6.12	70 Strokes, 428 Gals.	1 1/2	2 1/2	8	6	85 x 19	750 00
I	12	12	12	5.87	100 Strokes, 587 Gals.	1 1/2	2 1/2	8	6	66 x 21	650 00
II	12	12	18	8.80	70 Strokes, 616 Gals.	1 1/2	2 1/2	8	6	96 x 24	775 00

Patterns also for larger sizes or other Combinations of Cylinders.

The water cylinders are arranged with composition linings, valve seats, valve bolts, piston rods, stuffing-boxes, and water pistons; these last are packed with adjustable fibrous packing.

Auxiliary Boiler Feed Pumps (single action plunger pattern) attached when required. Prices as follows: Sizes A*, A and AA, \$15; sizes AAA and B, \$25; sizes BB, BBB and C, \$35, etc. Prices of pumps with water cylinders entirely of composition, extra. The hand power attachment applied to the first four sizes.

In ordering, parties will please state fully the duty to be performed, also size and length of pipes.



CLAYTON'S VERTICAL BELT OR HAND AIR COMPRESSORS AND AIR RECEIVERS.

DESCRIPTION OF COMPRESSORS.

This is an inexpensive type of small Compressor largely used for service requiring a limited volume of compressed air. They are employed for operating small plants of pneumatic tools or oil burners, where not more than two tools or burners are used; for charging dry pipe systems of automatic sprinklers; testing and inflating pneumatic tires; operating small sand blasts; spraying the finishing solution on ribbons and other textiles, and in various minor uses of compressed air. They are also extensively employed in experimental work, enabling experimenters to test a device or process in which the use of compressed air is necessary, and avoiding the expense of installing a larger Compressor until success is assured. Many patented processes have been developed in this manner, leading eventually to the sale of larger Compressors.

The power required to drive these Compressors varies according to the pressure at which they operate, but does not exceed $1\frac{1}{2}$ horse power for the largest size, at the maximum speed and pressure stated, and one horse power will drive any size under usual conditions. These Compressors are arranged to be bolted to a wall or pillar, the bolts passing through lugs cast on the frame. Their construction throughout is very strong, with heavy crank box and bearings. The crank is of steel and the valve box and valves of composition metal, especially suited to the purpose. The valves are similar in design to those used in our larger Compressors. The pistons are metallic with composition metal piston rings, especially adjusted to remain tight under pressure.

The sizes of pulleys stated in lists are suitable for the air pressures named, but can be varied to meet special conditions.

A full line of sizes is carried in stock, and any size can be promptly furnished singly, or in dozen lots.

Plate 1190.

PRICES OF BELT COMPRESSORS ONLY.

Size No.	Diam. of Air Cylinder in Inch	Length of Stroke in Inch	Air Inlet in Inches	Air Discharge in Inches	Revolutions per Min.	Cubic Feet of Free Air per Minute	Approximate Weight in Lbs.	Attainable Air Pressure in Lbs. per Square Inch	Size of Pulley for Pressures up to 100 Lbs. per Square Inch	Size of Pulley for Maximum Air Pressure Attainable	Price with Single Pulley as shown	Extra Cost of Fast and Loose Pulleys, including extra length of Shaft and Outside Collar	
												100 Lbs. Pressure	Maximum Pressure
2	2 $\frac{1}{4}$	6	$\frac{1}{2}$	$\frac{1}{2}$	150	2	170	250	18x3	22x3 $\frac{1}{2}$	\$ 50 00	\$ 6 00	\$ 7 00
3	3	6	$\frac{3}{4}$	$\frac{3}{4}$	150	3	190	200	22x3 $\frac{1}{2}$	24x4	60 00	7 00	8 00
4	4	6	1	1	140	6	250	200	24x4	30x5	70 00	8 00	14 00
5	5	6	1	1	140	10	300	200	30x5	36x5	80 00	14 00	15 00
6	6	6	1 $\frac{1}{4}$	1 $\frac{1}{4}$	130	13	375	150	36x6	36x7	90 00	15 00	16 00
7	7	6	1 $\frac{1}{4}$	1 $\frac{1}{4}$	130	17	400	100	36x7	36x7	100 00	16 00	16 00

AIR RECEIVERS.

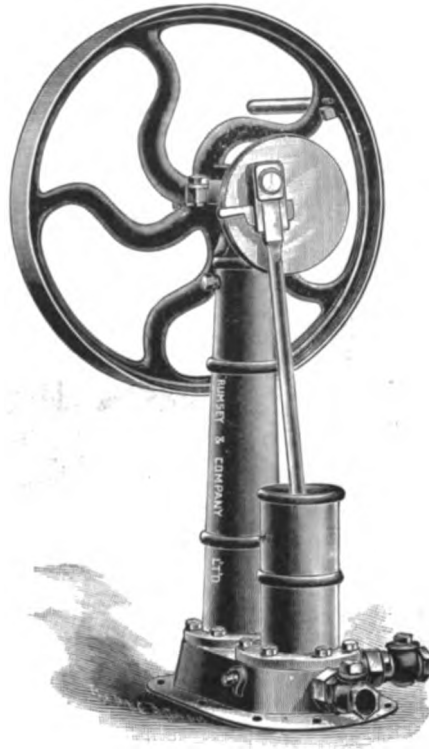
These Air Receivers, for holding compressed air, insure a steady, even pressure of air. Any size of Air Receiver given in list would be suitable for use with any of the six sizes of Air Compressors, but the larger the Air Receiver the more air can be stored and the more steady the pressure. They are built of heavy iron or steel, galvanized, and are fitted with pressure gauge, glass water gauge, safety valve and try cock complete. Special estimates will be given on air Receivers for higher pressures.

DIMENSIONS OF AIR RECEIVERS.

Diameter, Inches.	14	16	20	24	24	24	30	36	36	42	42	48	54	54	60
Height, Feet.	5	5	5	6	7	8	6	6	8	8	10	12	12	16	16
Capacity, Cubic Feet. . . .	5	7	11	18	22	25	30	42	56	75	96	150	190	250	314
*Price, 60 Lbs. Pressure. . .	\$40 00	\$45 00	\$55 00	\$80 00	\$85 00	\$95 00	\$82 00	\$100 00	\$110 00	\$125 00	\$145 00	\$180 00	\$215 00	\$245 00	\$300 00
*Price, 75 Lbs. Pressure. . .							95 00	110 00	125 00	145 00	160 00	200 00	235 00		
*Price, 110 Lbs. Pressure. . .															

*Suitable for No. 3 Rock Drills.

Special prices upon Air Receivers for higher pressures will be quoted upon application.

RUMSEY'S AIR COMPRESSOR AND VACUUM PUMP.**Plate 1191.**

This Pump can be operated by either hand or power, and a pressure of eighty or more pounds is easily maintained by hand. The suction and discharge can be taken from either side of Pump by reversing the plug with the valves as shown in cut.

Made in one size only.

Diameter of Cylinder, 4 inches; Stroke, 5 inches; Capacity per Revolution, 62 cubic inches.

Weight, 230 pounds.

Price \$50.00.

KNOWLES' OR BLAKE'S PATENT AIR COMPRESSORS. STEAM ACTUATED.

CRANK AND FLY-WHEEL PATTERN.

For Elevating Acids by Air Pressure, and for Operating Pneumatic Machinery.

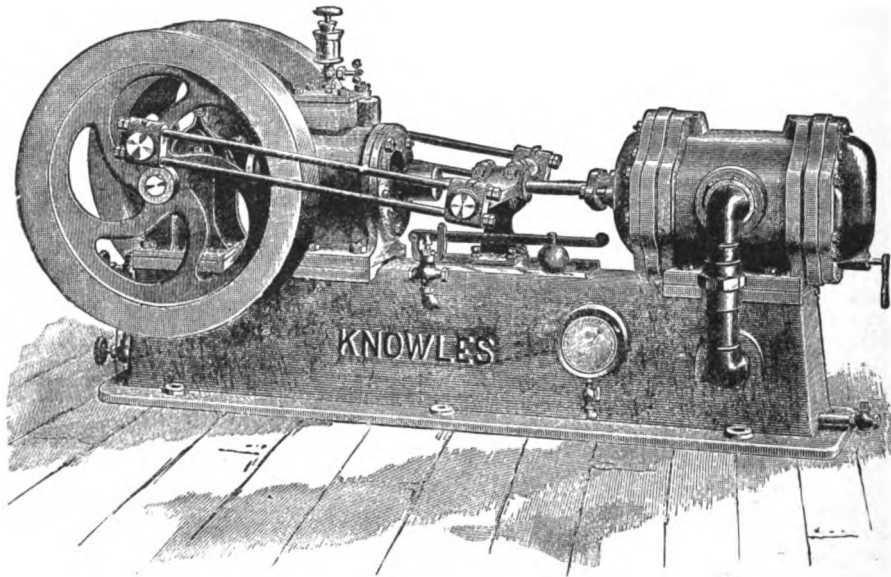


Plate 1192.

These simple and effective Crank and Fly-Wheel Air-Compressors are very economical both in first cost and running expenses. They are provided with a plain D slide valve, and the simplest design of mechanism. The air valves are in the heads of air cylinders, and arranged in a special manner that insures safety and close work. The air cylinders have spiral water jackets for keeping down the temperature of the compressed air. The air pistons have adjustable packing rings. Suction nozzles are provided so that air can be taken through piping from out of doors, or from any other place where cool air, free from dust, can be drawn. The engraving above illustrates a machine of moderate size, many of which are in use in oil refineries, for elevating sulphuric acids. The operation is to charge a reservoir with air which is in connection with the tank holding acid. The necessary air pressure, when applied on the surface of the body of acid, elevates the acid with the same certainty as though it was directly pumped, while the result is more satisfactory.

Steam Cylinder	Air Cylinder	Stroke	Cubic Ft. Free Air per Rev.	Revolutions per minute	Steam Pipe	Exhaust Pipe	Suction Pipe	Discharge Pipe	Price
6	5	7	.20	120 to 150	1	1½	3½	2½	\$ 350 00
6	6	7	.24	120 to 150	1	1½	4	3	375 00
6	7	7	.32	120 to 150	1	1½	4½	3½	400 00
8	5	7	.20	120 to 150	1¼	2	3½	2½	400 00
8	6	7	.24	120 to 150	1¼	2	4	3	425 00
8	7	7	.32	120 to 150	1¼	2	5	3½	450 00
8	8	7	.38	120 to 150	1¼	2	..	..	475 00
10	7	12	.53	100 to 140	2	3	..	..	700 00
10	8	12	.68	100 to 140	2	3	..	..	750 00
10	10	12	1.08	100 to 140	2	3	..	..	900 00
10	12	12	1.56	100 to 140	2	3	..	..	1100 00

Also patterns for larger sizes or other combinations of cylinders.

Above prices include the hollow-bed (which forms the air-receiver), pressure-gauge, safety-valve, glass water-gauge, and drain cock; also the delivery connection from air-cylinder to receiver. The first five sizes are arranged with the hollow-bed receiver. Larger sizes have separate receivers of boiler iron.

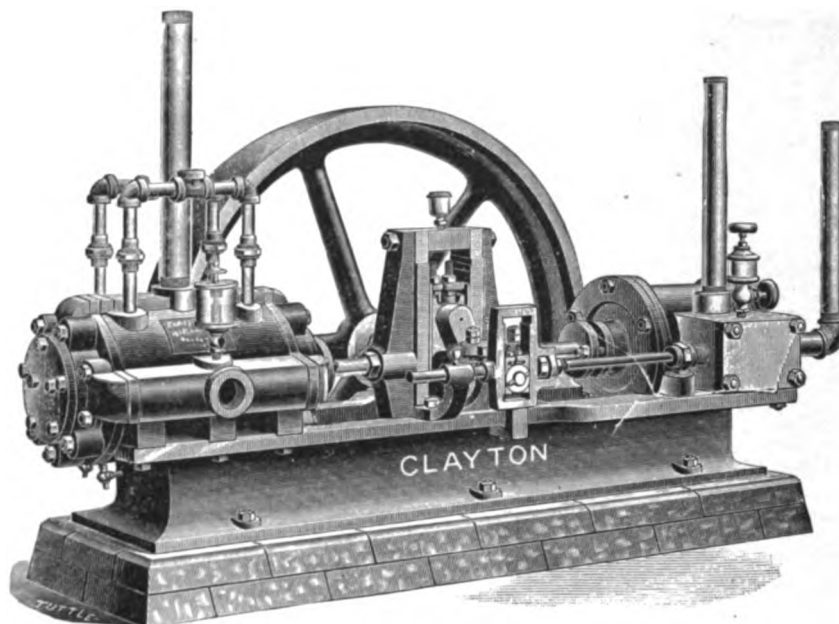
We also have designs and patterns for our Direct-Acting Air-Compressors, which are less costly than the above. For places where only moderate air pressure is required, and where economy of fuel is of no particular object, these Pumps are very serviceable. Prices on application.

CLAYTON SINGLE AIR COMPRESSORS.

SLIDING JOURNAL BOX PATTERN.

STEAM-ACTUATED, AND WITH DOUBLE-ACTING AIR CYLINDER,

Surrounded by Patent Water Jacket. Suitable for 25 to 125 Pounds Air Pressure, according to the Steam Pressure Carried.

**Plate 1193.**

This Compressor is suitable for the same duty as the Duplex Compressor.

The Duplex type has many points of advantage not obtainable in a Single Machine, but the latter is sometimes preferred on account of its lower first cost for an equivalent capacity.

Prices are given for each size with and without the Patent Air Pressure Governor. Special prices will be quoted on these Compressors equipped with our Patent Combined Speed and Pressure Governor, if desired.

We have patterns for many sizes not included in lists. It is therefore advisable to furnish us with a full statement of the duty required, in order that we may submit an estimate upon a compressor especially suited to the service it is to perform.

We carry a large stock of finished Compressors, and in addition, keep a full line of parts on hand ready for prompt construction.

These Compressors can be safely operated at an increase of twenty-five per cent over the number of revolutions stated. We rate their capacities at moderate speeds purposely, believing that it is always more economical to have Air Compressors, like boilers or engines, of ample capacity for the requirements.

Plan of foundation is furnished with each machine.

Each Compressor is thoroughly tested before shipment in excess of the working pressure required, and is warranted to perform the duty for which it is sold. Prices include all Mountings, Lubricators and Wrenches complete.

These sizes are suitable for an air pressure 10 to 15 pounds in excess of the steam pressure carried.

Diam. of Steam Cylinder in Inches	Diam. of Air Cylinder in Inches	Length of Stroke in Inches	Steam Supply in Inches	Steam Exhaust in Inches	Air Inlet in Inches	Air Discharge in Inches	Revolutions per Minute	Cubic Feet of Free Air per Minute	Approximate Weight in Pounds	Horse-power Required at 60 to 80 Pounds Air Pressure	Price without Air Governor	Price with Patent Air Governor
4	4	5	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$	150	11	700	2	\$165 00	\$190 00
5	5	6	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	140	19	900	3	225 00	255 00
6	6	7	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	130	30	1,200	4	250 00	280 00
7	7	7	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	130	40	1,400	5	300 00	335 00
8	8	7	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	130	53	1,600	7	350 00	385 00
9	9	9	$1\frac{1}{2}$	2	2	2	130	86	2,200	10	450 00	490 00
9	10	9	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$	130	106	2,500	10	500 00	540 00
10	10	9	2	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	130	106	3,500	13	660 00	705 00

CLAYTON BELT AIR COMPRESSORS.

LATEST IMPROVED PATTERN.

WITH DOUBLE-ACTING AIR CYLINDER,

Surrounded by Patent Water Jacket. Suitable for 25 to 150 Pounds Air Pressure per Square Inch.

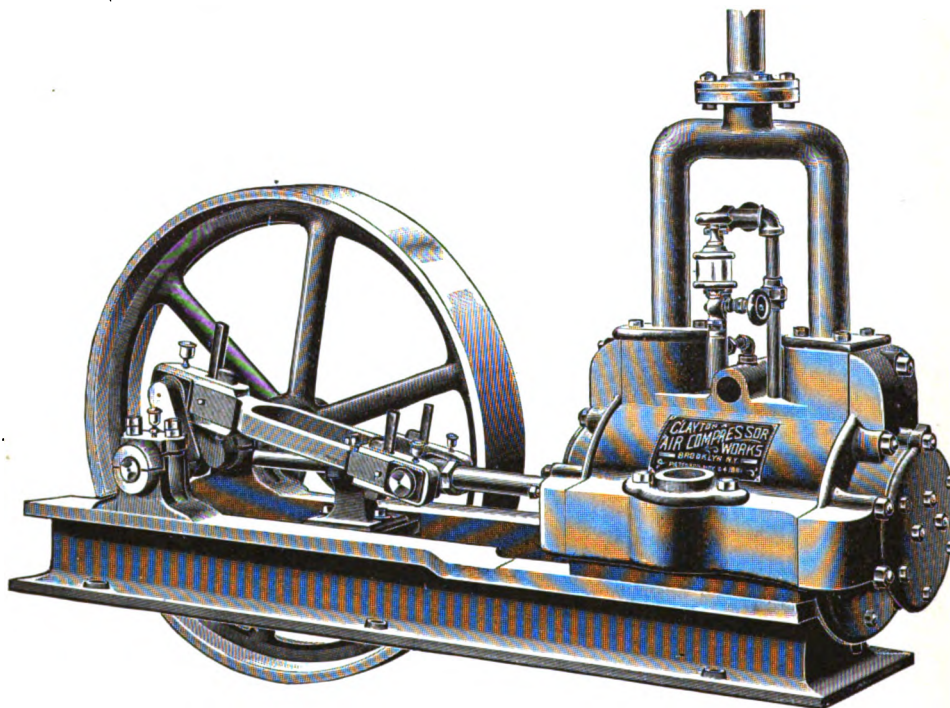


Plate 1194.

Diameter of Air Cylinder in Inches	Length of Stroke in Inches	Air Inlet in Inches	Air Discharge in Inches	Revolutions per Minute	Cubic Feet of Free Air per Minute	Approximate Weight in Pounds	Horse Power Required at 60 to 80 lbs. Air Press.	Price without Governor	Price with Patent Governor
4	5	1¼	1¼	150	11	500	2	\$ 135 00	\$ 170 00
4	7	1¼	1¼	140	15	650	2½	170 00	205 00
5	6	1¼	1¼	140	19	650	3	185 00	220 00
6	7	1½	1½	130	30	850	4	200 00	240 00
7	7	1½	1½	130	40	1,250	5	250 00	290 00
8	7	1½	2	130	53	1,500	7	300 00	345 00
9	9	2	2	130	86	1,900	10	350 00	395 00
10	9	2½	2½	130	106	2,000	12	400 00	450 00
10	13	2½	2½	130	154	3,000	18	700 00	750 00
12	13	2½	3	130	221	5,800	30	850 00	915 00
14	15	*Open	3½	120	320	7,500	40	1,150 00	1,230 00
16	15	*Open	3½	120	419	8,500	50	1,500 00	1,580 00
16	20	*Open	4	100	465	10,000	70	1,800 00	1,895 00
18	24	*Open	4½	90	636	12,500	100	2,300 00	2,410 00
20	24	*Open	5	90	785	15,000	125	2,800 00	2,930 00
24	24	*Open	6½	90	1,130	18,000	175	3,500 00	3,655 00
24	30	*Open	6½	80	1,257	22,500	200	.....	.....

. The smaller sizes can be especially constructed to operate under 300 pounds air pressure if desired.

When preferred, these compressors are built with gear wheels. Special prices will be quoted upon compressors constructed in this manner or arranged to attach direct to engine shaft.

We have patterns for special sizes not included in above list. It is therefore advisable to furnish us with a full statement of the duty required in order that we may submit an estimate upon a compressor especially suited to the service it is to perform.

We carry a large stock of finished compressors, and in addition, keep a full line of parts on hand ready for prompt construction. These compressors can be safely operated at an increase of 25 per cent over the number of revolutions stated. We rate their capacities at moderate speeds purposely, believing that it is always more economical to have air compressors like boilers or engines, of ample capacities for the requirements. Plan of foundation is furnished with each machine.

Each compressor is thoroughly tested before shipment, in excess of the working pressure required, and is warranted to perform the duty for which it is sold.

Prices include all mountings, lubricators and wrenches complete, necessary boxing and delivery free on board cars.

*These compressors can be built with the air inlet valves exposed to the atmosphere, or with the valves enclosed for pipe connection, as may be preferred. Cooler air may be obtained from a point outside the engine room, shaded from the sun, and a higher efficiency in air compression secured thereby. In placing order, it should be specified which arrangement is desired.

CLAYTON DUPLEX AIR COM- PRESSORS.

LATEST IMPROVED PATTERN.

STEAM ACTUATED, AND WITH DOUBLE-
ACTING AIR CYLINDERS,

Surrounded by Patent Water Jackets. Suitable for 25 to
125 Pounds Air Pressure, according to the Steam
Pressure Carried.

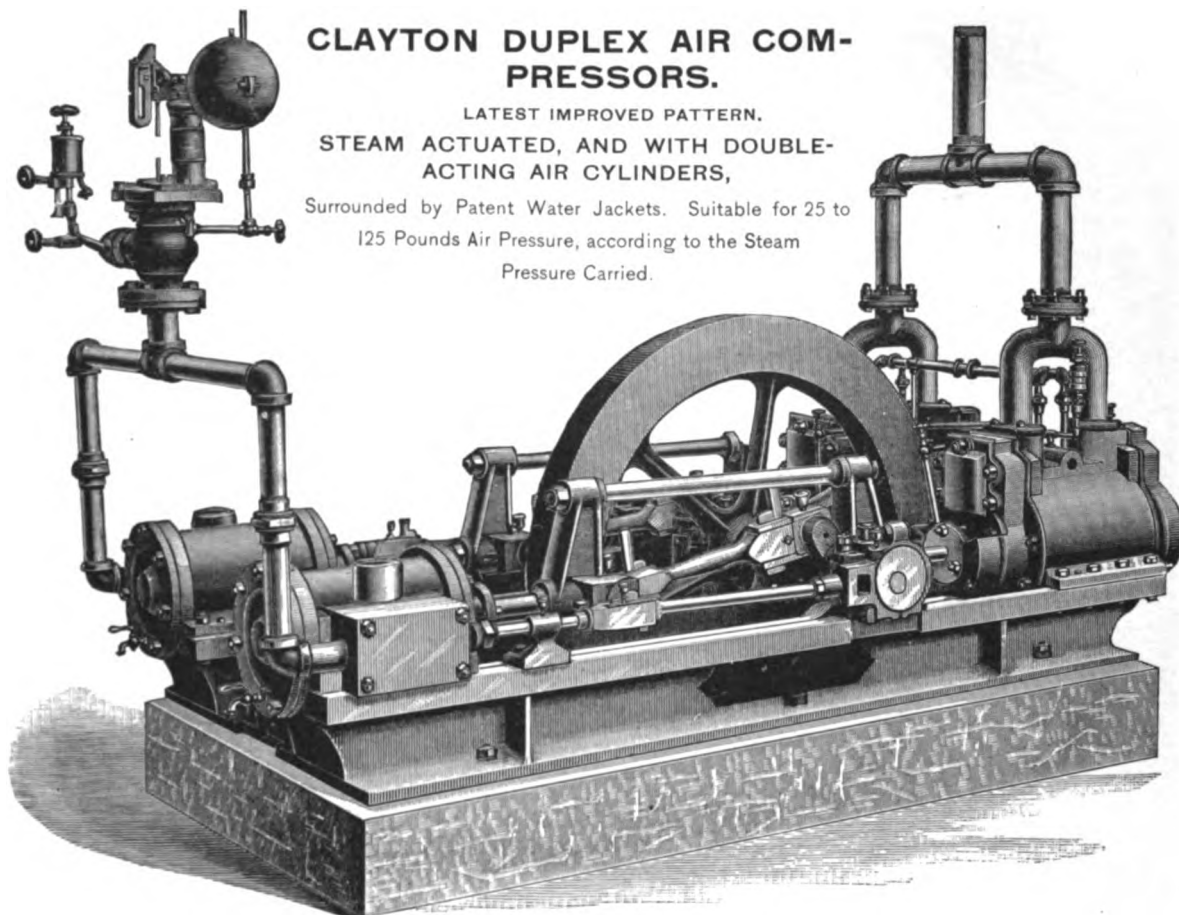


Plate 1195.

These sizes are suitable for an air pressure 15 to 20 pounds in excess of the steam pressure carried.

Diameter of Steam Cylinders in Inches	Diameter of Air Cylinders in Inches	Length of Stroke in Inches	Steam Supply in Inches	Steam Exhaust in Inches	Air Inlet in Inches	Air Discharge in Inches	Revolutions per Minute	Cubic Feet of Free Air per Minute	Approximate Weight in Pounds	Horse-power Required at 80 to 100 pounds Air Pressure	Price
4	4	5	1	1 1/4	1 1/4	1 1/2	150	21	1,500	4	\$ 400 00
5	5	6	1 1/4	1 1/4	1 1/4	1 1/2	140	38	2,000	6	485 00
6	6	7	1 1/4	1 1/2	1 1/4	1 1/2	130	60	2,500	8	525 00
7	7	7	1 1/2	2	1 1/4	2	130	80	3,000	10	605 00
8	8	9	1 1/2	2	1 1/2	2 1/2	130	105	3,500	14	715 00
9	9	9	2	2 1/2	2 1/2	2 1/2	130	172	4,500	20	990 00
10	10	9	2	2 1/2	2 1/2	3	130	212	5,000	20	1,100 00
10	10	10	2	2 1/2	2 1/2	3	130	212	6,000	25	1,320 00
10	10	18	2	2 1/2	open	3	130	907	7,000	40	1,540 00
12	12	13	2 1/2	3	2 1/2	3 1/2	130	442	10,000	60	2,200 00
14	14	15	3	3 1/2	open	4	120	641	15,000	80	3,025 00
16	16	15	3 1/2	4	open	4	120	838	17,000	100	4,125 00
16	16	20	3 1/2	4 1/2	open	4 1/2	100	930	20,000	140	4,950 00
18	18	24	4	5	open	5	90	1,272	25,000	200	6,050 00
20	22	24	4 1/2	5 1/2	open	6	90	1,901	35,000	250	.....
22	24	30	5	6	open	7	80	2,513	50,000	350	.....
24	26	36	5 1/2	6 1/2	open	8	80	3,544	67,000	400	.....

The prices in above lists are for Compressors built according to the latest improved regular pattern and include the Patent Air Governor, but special prices will be quoted on Compressors equipped with our Patent Speed and Pressure Governor, when it is desired in addition to the other patented features. Special prices will also be quoted on Compressors with compound Steam or Air Cylinders, or both, as these Compressors must be proportioned especially to suit individual requirements. These sizes are adapted to the uses of compressed air in the manufactures, arts and sciences, and we have in addition, patterns for many sizes and special proportions not included in the lists. It is therefore advisable to furnish us with a full statement of the duty required, in order that we may submit an estimate upon a Compressor especially suited to the service it is to perform. The larger sizes can be fitted with Globe or Angle Valves in steam and air pipes, when so ordered, so that one side of a Duplex Compressor can be readily disconnected and run as a single machine, while the other side is being repaired. We carry a large stock of finished Compressors and in addition keep a full line of parts on hand ready for prompt construction. These Compressors can be safely operated at an increase of twenty-five per cent over the number of revolutions stated. We rate their capacities at moderate speeds purposely, believing that it is always more economical to have Air Compressors, like boilers and engines, of ample capacity for the requirements. Plan of foundation is furnished with each machine. Each Compressor is thoroughly tested before shipment in excess of the working pressure required, and is warranted to perform the duty for which it is sold. Prices include all Mountings, Lubricators and Wrenches complete.

KNOWLES' OR BLAKE'S IMPROVED DUPLEX AIR COMPRESSORS.

HORIZONTAL CRANK AND FLY-WHEEL PATTERN.

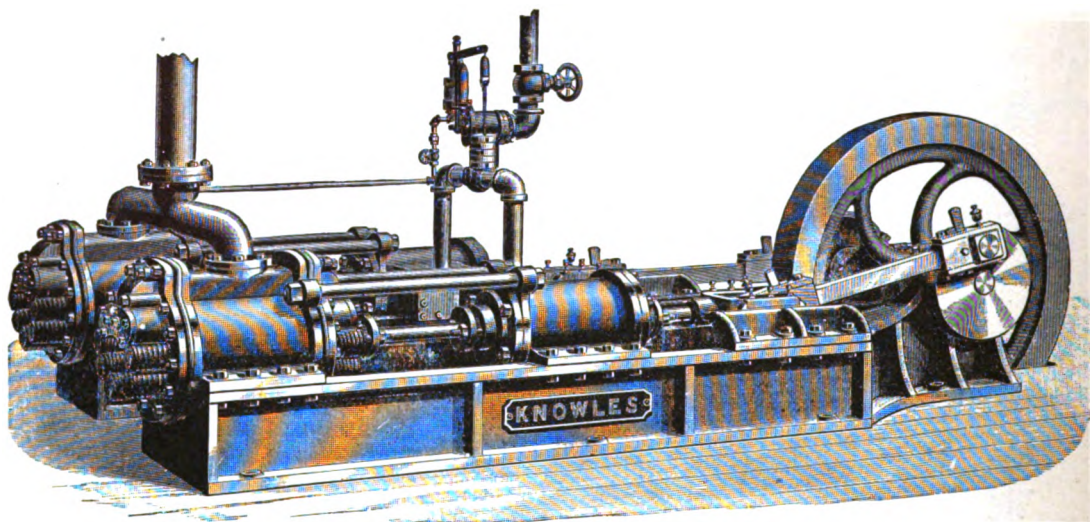


Plate 1196.

For operating rock drills, pumps, and similar forms of mining and tunneling machinery; for supplying air to caissons and other submarine apparatus; for refrigerating machinery; for the *pneumatic despatch system; for compressing illuminating and other gases, and for general purposes where a steady pressure is required, these improved Duplex Air Compressors are especially adapted. They are compact, very efficient, and economical in use of steam and in general running expenses.

The engraving above represents one of the designs we have adopted. The piston-rods of the steam cylinders are attached to the piston-rods of the air cylinders by light but very stiff and strong connections of improved form. The connecting-rods and shaft are of best forged iron; the bearings are of generous proportions and carefully designed to take up wear and to insure thorough lubrication. The steam valves are plain D slide valves, and arranged to cut off steam at the most efficient and economical point of stroke; the piston-rods are of steel and the pistons arranged with adjustable packing; the cranks are of disc form and balanced; the bed-plate is made solid and well proportioned.

The air cylinders are kept cool by an improved form of water jacket. These jackets can be supplied with the necessary circulation of water by a double-acting pump, placed between the two air cylinders and worked by an eccentric upon the crank shaft, or from an independent pump, tank, or other source.

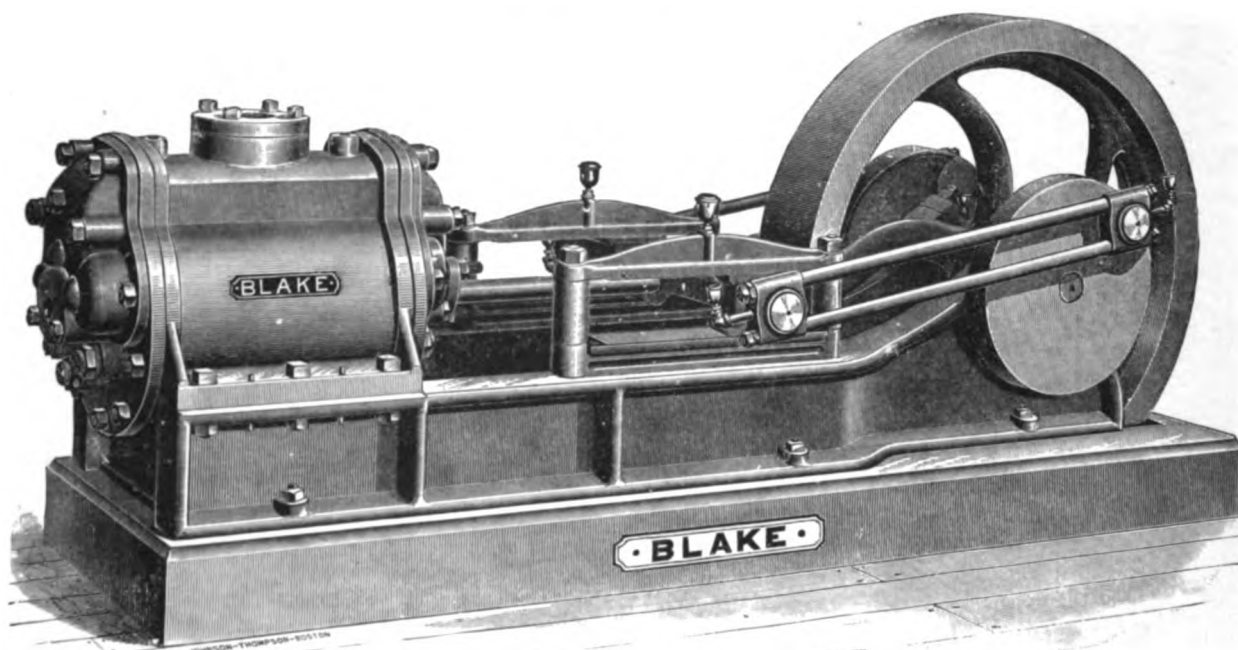
The speed of the Compressor is controlled by a governor valve on the steam pipe, connected with and moved by a regulator, which is operated by the pressure from the air cylinders. No attention is required from the engineer, as the compressor regulates its own speed, starting and stopping automatically as the air is used or shut off. Variation of the steam pressure does not affect the running of the Compressor, as the regulator controls the speed and keeps the air at a uniform pressure.

Steam Cylinders, Inches	Air Cylinders, Inches	Stroke, Inches	Revolutions per minute	Cubic Feet Free Air per minute		H. P. of Boiler	Number of 3-in. Rock Drills will run	Weight	Price
				Theoretical	Actual				
8	8	12	140	190	143.5	30	2	9500	.....
8	9	12	140	246	184.5	35	3	9600	.....
10	10	12	140	302	226.5	40	4	10500	.....
10	12	12	140	437	327.75	60	6	11000	.....
12	12	12	140	437	327.75	60	6	11500	.....
12	14	12	140	596	447.	80	8	11700	.....
14	14	12	140	596	447.	80	8	13100	.....
16	16	18	100	836	629.	130	10 to 12	19000	.....
18	18	18	100	1056	792.	170	14 to 16	25500	.....

Also patterns for larger sizes or other combinations of Cylinders.

Parties ordering Air Compressors will state fully the particulars of duty to be performed. If for working rock drills, state size and make of drills. If for running coal cutting machines, pumps or other like machinery, state size of cylinders, speed and required air pressure.

*We have built several complete sets of our improved Air-Compressing Engines for the largest and most modern designed pneumatic despatch system in the world, aggregating 1600 horse-power.

BLAKE'S IMPROVED POWER AIR COMPRESSORS.**SINGLE CYLINDER DOUBLE-ACTING PATTERN.****Plate 1197.**

This form of Air Compressor is used where it is found more convenient to work them by power, as for instance, by belt connection with a line of shafting. These machines are principally used for operating rock drills, pneumatic machinery, and for supplying furnaces and forges burning oil as fuel; also for supplying atomizers for moistening air in cotton mills, etc. They are also arranged for refrigerating and other machinery, as Exhaustion Pumps or Combined Compressors and Exhausters.

These Compressors, as also all similar pumping machinery made by us, are designed to obtain the highest possible results in economy, durability and reliability. They are simple, thoroughly well made, and possess the following advantages: The Suction Valves are enclosed, thus permitting the use of a suction supply pipe to conduct cool, clear air wherever the machine is placed. The Air Valves are so arranged in the Cylinder heads as to insure safety. The Air Pistons have adjustable packing. The Air Cylinders are kept cool by an improved form of water jacket, etc. The Clearances in the ends of the Air Cylinders are reduced to a minimum.

Diam. of Cylinder, Inches	Stroke, Inches	Cubic Feet Free Air per Rev.	Revolu- tions per Minute	Suction Pipe, Inches	Discharge Pipe, Inches	Price
5	7	.16	75 to 100	2 1/2	2 1/2	.....
6	7	.2289	75 to 100	2 1/2	2 1/2	.....
7	7	.3117	75 to 100	2 1/2	2 1/2	.....
6	10	.3272	50 to 75	2 1/2	2 1/2	.....
7	10	.4454	50 to 75	3	3	.....
8	10	.5817	50 to 75	.....	.....	.....
10	10	.909	50 to 75	.....	.....	.....
12	10	1.309	50 to 75	.....	.....	.....
14	12	2.14	50 to 75	.....	.....	.....
16	18	3.351	40 to 60	.....	.....	.....
18	18	4.241	40 to 60	.....	.....	.....
20	18	5.236	40 to 60	.....	.....	.....

Also patterns for larger sizes or machines for heavier work.

The first three sizes are provided with heavy band wheels; all other sizes with fast and loose pulleys and gears. All sizes up to 14 inch cylinder can be furnished without gears for light pressures. These pumps also arranged with independent steam cylinder, enabling them to be driven by steam or by power as occasion may require.

RAND'S DIRECT-ACTING STEAM AIR COMPRESSORS.
CLASS C.

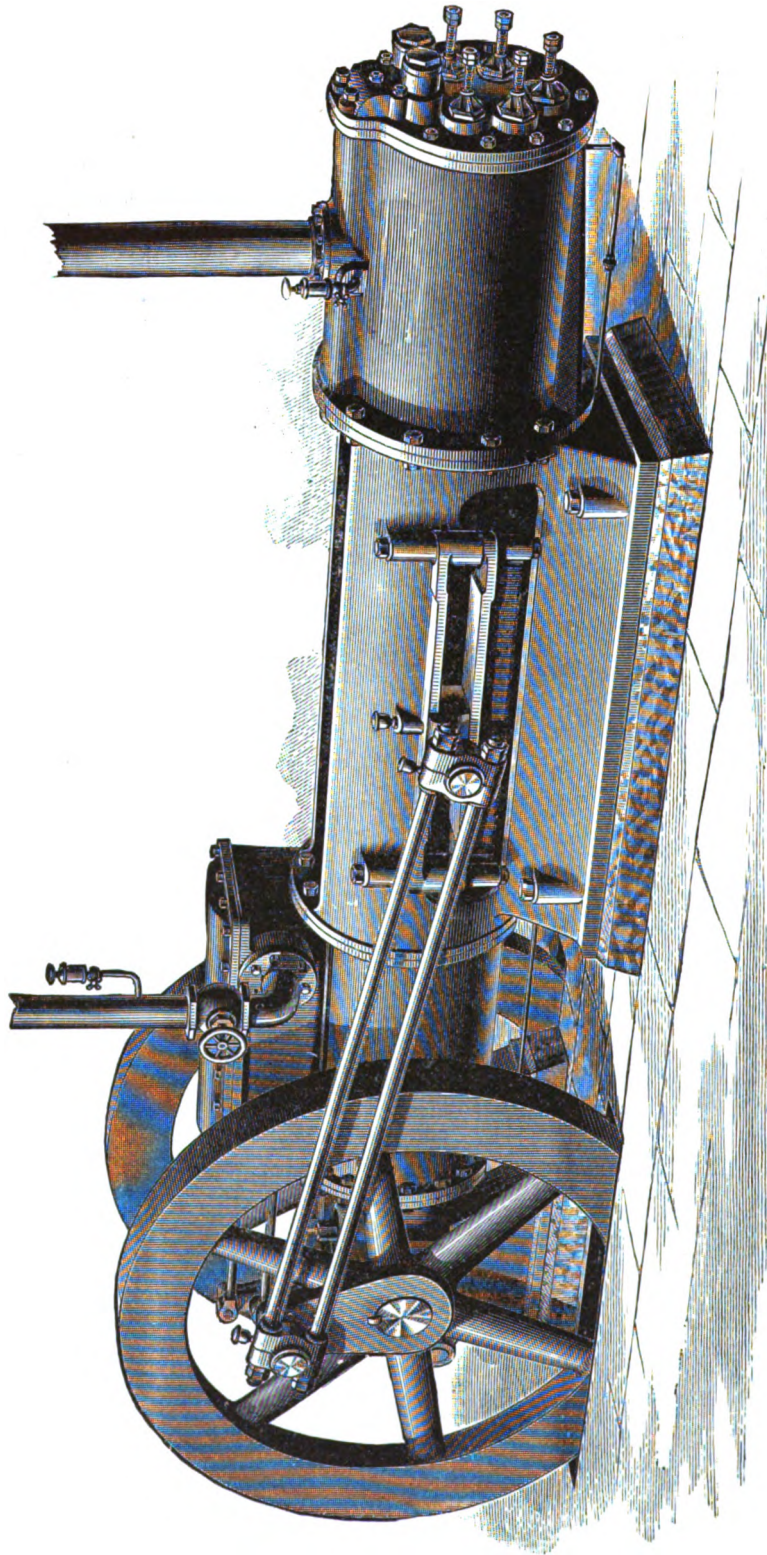


Plate 1198.

See description, page 543.

DETAILS OF AIR COMPRESSORS.

CLASSES A, B AND C.

CLASS.	SIZE OF AIR CYLINDER, INCHES.	Revolutions per minute.	Capacity in Drills.		Horse Power of Boiler Needed.	DIAMETER OF PIPES.						SHIPPING WEIGHTS.		DIMENSIONS OF		OVER ALL DIMENSIONS. Feet and Inches.				
			No. 2.	No. 3.		STEAM.		AIR.		WATER CIRCULATION.		Pounds.	Heaviest Piece.	BULKIEST PIECE, Feet and Inches.	Length.	Width.				
						Main from Boiler.	Branch to each Cyl.	Exhaust from each Cyl.	Main to Re- ceiver.	Branch from each Cyl.	To Cyl.						To Piston.			
B	10½ x 16 { Single Dup ..	100	2	2	23	2	2	2½	2½	2	2	2	2	10000	1800*	120	7'	x3½' x10' ¼"	17'-0"	5'-7"
		100	5	4	45	2½	3	2½	3	2½	3	3	3	14000	1800*	175	9'	x3½' x10' ¼"	17'-0"	7'-1"
	14 x 22 { Single Dup ..	85	6	5	55	3½	4	3½	4	3½	4	4	4	23000	2500+	400	9'	x4½' x14' ¼"	22'-4"	6'-10"
		85	12	10	110	4	3½	3½	4	3½	3½	3½	3½	33000	2500+	600	9'	x4½' x14' ¼"	22'-4"	8'-6½"
A and B	16½ x 30 { Single Dup ..	75	10	8	88	4	4	6	5	1	1	1	1	35000	6500+	600	12'	x6' x18' ¼"	A32'-1" B28'-11½"	8'-3½"
		75	20	16	175	5	4	6	6	5	1	1	1	52000	6500+	900	12'	x6' x18' ¼"	A32'-1" B28'-11½"	10'-2"
	18 x 30 { Single Dup ..	75	12	10	105	4	4	6	5	1	1	1	1	36000	6500+	600	12'	x6' x18' ¼"	A32'-1" B28'-11½"	8'-3½"
		75	25	20	210	5	4	6	6	5	1	1	1	55000	6500+	900	12'	x6' x18' ¼"	A32'-1" B28'-11½"	10'-2"
A and B	20 x 48 { Single Dup ..	50	15	12	140	5	5	7	6	1½	1½	¾	¾	63000	8500+	1200	14'	x7' x22' ¼"	A43'-9¾" B39'-5"	14'-0"
		50	30	25	280	6	5	7	8	6	1½	1½	¾	¾	99000	8500+	1800	14'	x7' x22' ¼"	A43'-10" B39'-5"	11'-3¼"
	28 x 48 { Single Dup ..	40	25	20	215	7	7	10	7	1½	1½	¾	¾	95000	11000+	2300	16'	x8' x22' ¼"	A47'-0" B42'-6"	15'-6"
		40	50	40	430	8	7	10	9	7	1½	1½	¾	¾	145000	11000+	3500	16'	x8' x22' ¼"	A47'-0" B42'-6"	18'-10"
A and B Geared.	32 x 48 { Single Dup ..	40	30	25	.....	.....	.....	.....	8	1½	1½	1	1	50000\$	12000+	.....	16'	x5½' x5½' ¼"	A29'-4" B24'-10"	12'-0"
		40	60	50	10	8	1½	1½	1	1	80000\$	12000+	16'	x5½' x5½' ¼"	A29'-4" B24'-10"	14'-6"
	32 x 60 { Single Dup ..	35	33	28	.....	.....	.....	9	.....	1½	1½	1½	1½	77000\$	17500+	.....	17'	x5½' x5½' ¼"	A36'-6½" B30'-6½"	13'-1¼"
		35	66	56	.....	.....	.....	11	9	1½	1½	1½	1½	125000\$	17500+	.....	17'	x5½' x5½' ¼"	A36'-6½" B30'-6½"	17'-0"
C	36 x 60 { Single Dup ..	30	35	30	.....	.....	.....	12	.....	1½	1½	1½	1½	86000\$	18000+	.....	17'	x5½' x5½' ¼"	A36'-8½" B29'-9½"	14'-8"
		30	70	60	.....	.....	.....	14	12	1½	1½	1½	1½	140000\$	18000+	.....	17'	x5½' x5½' ¼"	A36'-8½" B29'-9½"	18'-6"
	8 x 12 { Single Dup ..	120	1	1	13	1½	.....	2½	1½	¾	¾	¾	¾	1800	300*	35	23	x2¾' x6"	7'-8¼"	1'-10¾"
		10	4	2	25	2½	.....	3	2½	¾	¾	¾	¾	4000	700*	75	3½	x3½' x7"	9'-4"	2'-4"
C	10 x 14 { Single Dup ..	100	4	3	35	2½	.....	4	3½	1½	1½	1½	1½	6000	1000*	118	4'	x4' x8"	10'-11¼"	2'-8¾"
		12	6	5	60	3½	.....	5	4	¾	¾	¾	¾	10000	1900*	210	5'	x5' x8½"	13'-9"	3'-1½"
	14 x 22 { Single Dup ..	95	6	5	80	4	.....	5	4	¾	¾	¾	¾	13000	2600*	310	5½	x5½' x10' ¼"	15'-2"	3'-7¼"
		90	10	8	90	4	.....	5	5	¾	¾	¾	¾	15000	3500*	620	6½	x6½' x10' ¼"	15'-8"	3'-7¼"
17½ x 24 { Single Dup ..	90	10	8	90	4	.....	5	5	¾	¾	¾	¾	15000	3500*	620	6½	x6½' x10' ¼"	15'-8"	3'-7¼"	
	20	15	12	140	5	.....	6	6	1	1½	1½	1½	1½	30000	6300*	800	8'	x8' x12"	19'-3¾"	4'-2½"

* Sole Plate. This size of compressor is made also in pieces for transportation on mule back. † One-half of Fly Wheel. ‡ Entire Fly Wheel, of which there are two. § Not including gear.

We furnish four classes of air compressors, designated as Class "A," Class "B," Class "C" and Class "D." Class "A" is of the same general style of construction as Class "B," the difference being in the method of circulating the water for cooling the air. Class "B" is a water power compressor. All these machines are regularly fitted for surface cooling, and deliver dry air. We can fit injection apparatus to any of them, if desired, but we scarcely think any such demand will be made at this day. The above are the standard designs for the ordinary pressures used in the operations of rock drilling—mining, tunneling, quarrying, etc., but we are prepared to and have furnished compressors to work at pressures above and below those mentioned, for purposes other than those of drilling rock.

HORIZONTAL HAND DRILLS.

No. 2, HORIZONTAL DRILL.

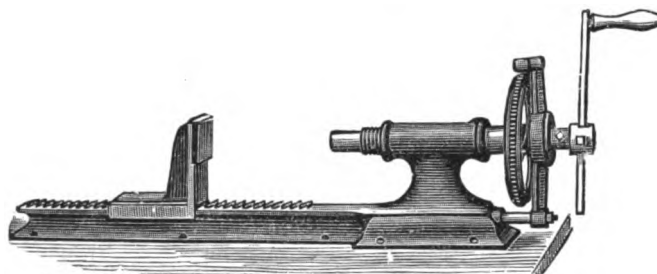


Plate 1199.

Our Horizontal Drills are strong and well-made machines; well adapted to the work intended, and in many cases will answer the purpose of a more expensive machine. The above cut shows our No. 2.

Length, 33 inches. Weight, 45 pounds. Hole in spindle, $\frac{1}{2}$ inch.

Price, as above	\$10 00
Price, with balance wheel	13 00

No. 4, HORIZONTAL DRILL.

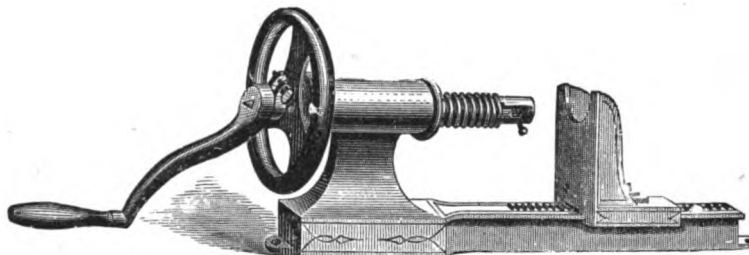


Plate 1200.

The above cut shows No. 4 Horizontal Drill with friction feed.

Length, 26 inches. Weight, 33 pounds. Hole in spindle, $\frac{1}{2}$ inch.

Price, with feed	\$6 75
Price, without feed	6 00

No. 5, HORIZONTAL DRILL.

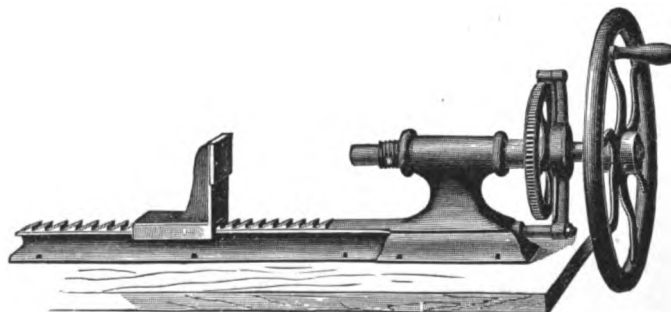
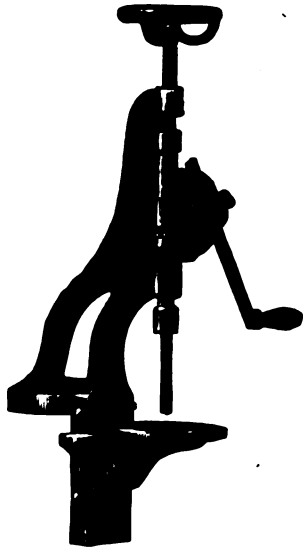


Plate 1201.

No. 5 is always furnished with balance wheel; has three changes of automatic feed; hole in spindle, $\frac{3}{4}$ inch. Length, 44 inches. Weight, 115 pounds.

Price	\$20 00
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COMBINED BREAST AND UPRIGHT BENCH DRILLS.**No. 8. UPRIGHT BENCH DRILL.****Plate 1202.****No. 9. UPRIGHT BENCH DRILL.****Plate 1203.****COMBINED BREAST AND UPRIGHT DRILL.****Plate 1204.****No. 8. UPRIGHT BENCH DRILL.**

Drills $\frac{1}{8}$ inch to $\frac{3}{4}$ inch hole, and to center of a 10 inch circle.

Length 33 inch

Weight 55 lbs.

Price \$12 00

Hole in spindle for $\frac{1}{2}$ inch straight shank drills.

No. 9. UPRIGHT BENCH DRILL.

Drills $\frac{1}{8}$ inch to 1 inch hole, and to center of a 10 inch circle.

Length 33 inch

Weight 75 lbs.

Price \$15 00

Hole in spindle for $\frac{1}{2}$ inch straight shank drills.

COMBINED BREAST AND UPRIGHT DRILL.

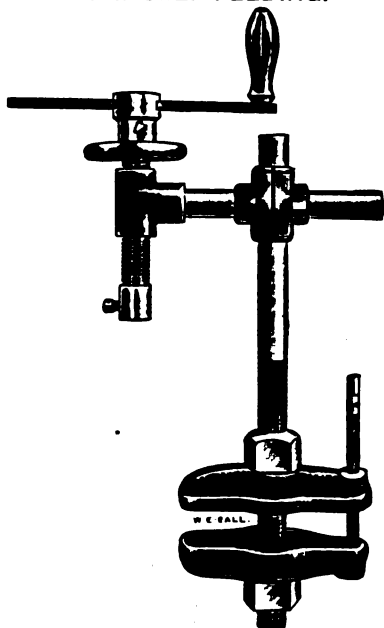
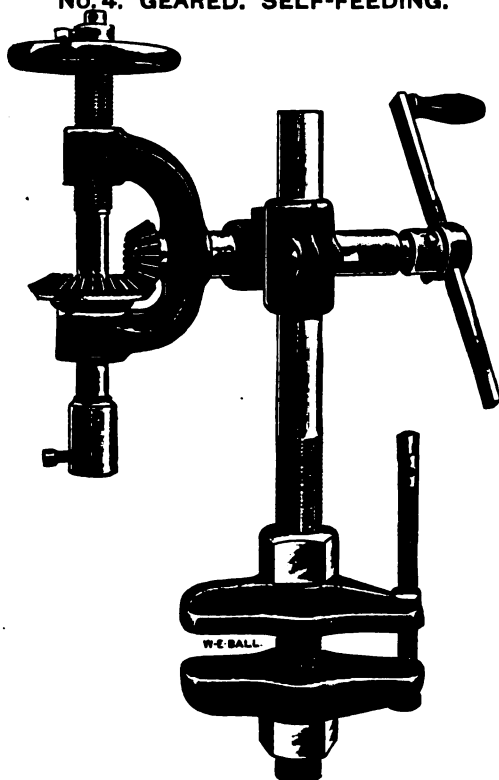
Weight of drill 3 lbs.

Weight of drill and stand 14 lbs.

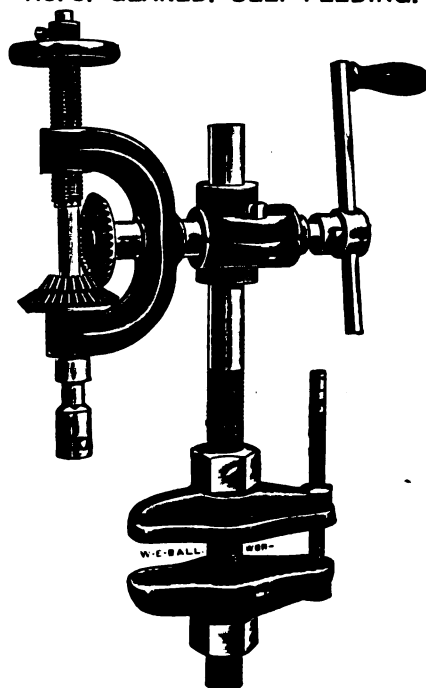
Price, without stand \$4 00

Price, with stand 8 00

Hole in spindle for $\frac{1}{4}$ inch straight shank drills.

NEW SWIVEL CLAMP DRILLS.**No. 1. SELF-FEEDING.****Plate 1205.****No. 4. GEARED. SELF-FEEDING.****Plate 1207.**

The above illustrates No. 4—our largest Clamp Drill—and is suitable for very heavy work. Will drill $1\frac{1}{2}$ inch hole. Traverse of spindle, 4 inches. Greatest distance between clamps, 5 inches. Diameter of post, 2 inches. Full length of post, 28 inches. Greatest distance between post and spindle, 14 inches. Hole in spindle, $\frac{1}{2}$ inch. Weight, 95 lbs. Price \$40 00

No. 3. GEARED. SELF-FEEDING.**Plate 1206.****NEW SWIVEL CLAMP DRILLS.
SELF-FEEDING.**

All of our Clamp Drills are furnished with our Patent Self-Feeding Attachment (not shown in illustrations), an entirely new feature in drills of this kind. This also, by reversing the motion of handle, secures a quick return of the drill bit, and leaves one hand always free to handle the work. No Clamp Drill is complete without it. These machines can also be used as a ratchet drill by adjustment of handle. All material used in their construction are of best quality. Are indispensable to iron bridge builders, architectural iron workers, boiler makers, railroad contractors, miners, etc.

Spindle and post are of steel; clamps and swivel joints of malleable iron. Drill chucks can be fitted to machine when desired.

Crank or handle is attached direct to spindle, and for light work is a most convenient tool. Will drill from 0 to $\frac{3}{8}$ -inch hole. Traverse of spindle, $2\frac{1}{2}$ inches. Greatest distance between clamps, 8 inches. Full length of post, 26 inches. Greatest distance between post and drill bit, $6\frac{1}{2}$ inches. Diameter of post, $1\frac{1}{4}$ inches. Hole in spindle for $\frac{1}{2}$ -inch straight shank drill. Weight, 28 pounds.

Price \$15 00

**No. 2. NEW SWIVEL CLAMP DRILLS.
SELF-FEEDING GEARED.**

Same as Nos. 3 and 4, varying only in size, being our smallest size geared drill. Will drill from 0 to $\frac{1}{8}$ inch hole. Traverse of spindle, 3 inches. Greatest distance between clamps, 8 inches. Greatest distance between post and drill bit, 10 inches. Diameter of post, $1\frac{1}{4}$ inches. Full length of post, 26 inches. Hole in spindle for $\frac{1}{2}$ inch straight shank drill. Weight, 30 pounds.

Price \$20 00

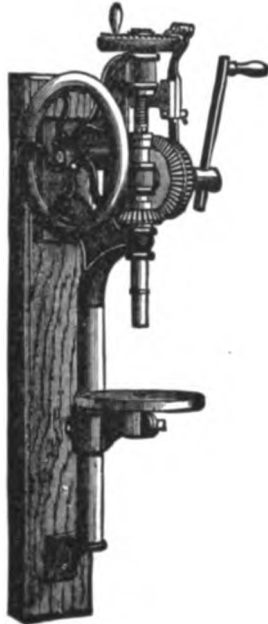
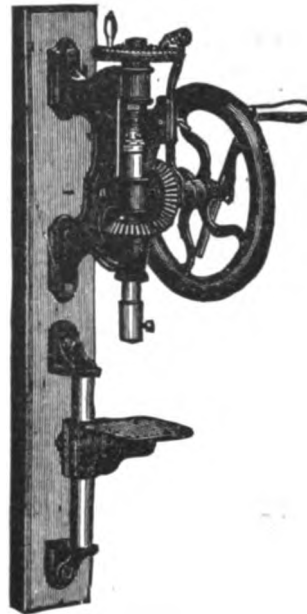
**No. 3. NEW SWIVEL CLAMP DRILL.—GEARED.
SELF-FEEDING.**

No. 3 has two sets or double gears for change of speed. When occasion requires it, handle or crank can be attached direct to spindle, as shown in cut of No. 1. Will drill from 0 to 1 inch hole. Traverse of spindle, $4\frac{1}{2}$ inches. Greatest distance between clamps, 7 inches. Greatest distance between post and drill bit, 10 inches. Diameter of post, 1 9-16 inches. Full length of post, 26 inches. Hole in spindle, $\frac{1}{2}$ inch. Weight, 65 pounds.

Price, with double gears \$25 00

Price, with single gear 23 00

In ordering, state whether single or double gears are wanted.

UPRIGHT SELF-FEEDING DRILLS.**No. 0.****Plate 1208.****No. 1.****Plate 1209.****No. 2.****Plate 1210.****NO. 0 DRILL.**

This size is intended for small, accurate work, and is a desirable tool for amateurs, electrotypers, and experimenters. The spur gearing is turned, finished and accurately cut. Spindle bored to receive $\frac{1}{4}$ inch straight shank drills, and turned tapering on end to receive small chuck for wire drills, has three grades of feed. Tight and loose pulleys for power are added to balance wheel shaft, at slight advance in cost, when so ordered. Drills from 0 to $\frac{3}{8}$ inch hole. Length, 26 inches. Weight, 30 pounds.

Price \$20 00

NO. 1 DRILL.

Spindle takes $\frac{1}{2}$ inch straight shank drills; has three changes of automatic self-feed, instantly adjusted from fine to coarse. Furnished with pulleys for power when so ordered. Drills from 0 to 1 inch hole. Length, 42 inches. Weight, 100 pounds.

For hand, as per cut \$23 00

With pulleys added 31 00

NO. 2 DRILL.

The swing table as applied to these machines will be found useful in many ways, and much more convenient than the old method of driving them in and out with a hammer, thereby running the risk of breaking the foot piece. It is out of the way when not in use, and may be quickly swung into position when wanted.

This machine is particularly adapted for power by attaching tight and loose pulleys, or cone pulley to shaft (A) outside of balance wheel. See illustration of No. 7 drill.

Spindle takes $\frac{1}{2}$ inch straight shank drill. Drills from 0 to $1\frac{1}{2}$ inch hole, and to center of 15 inch circle. Length, 54 inches. Weight, 160 pounds.

Price \$48 00

For power, with tight and loose pulleys 52 00

For power, with three step cone and countershaft. 73 00

No. 3.

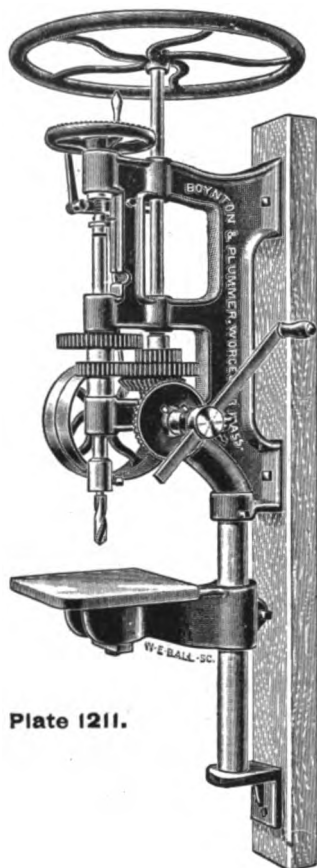


Plate 1211.

No. 4.

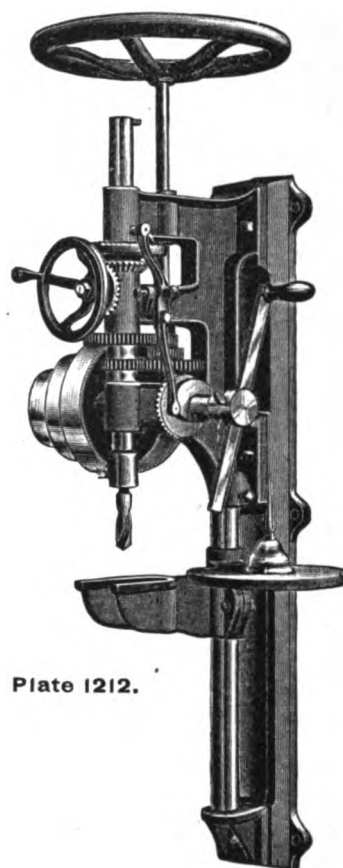


Plate 1212.

UPRIGHT SELF - FEEDING DRILLS.

No. 5.

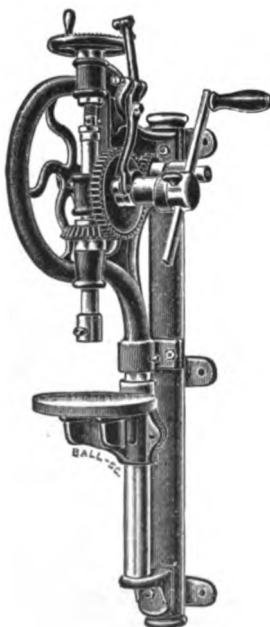


Plate 1213.

No. 3 DRILL.

No. 3 has cut gears so arranged that a quick or slow motion may be given the Drill, as desired, for light and heavy work, making a desirable tool for machine shop or factory, answering as well as higher cost machines. Spindle takes $\frac{1}{4}$ inch straight shank drills. Has our patent automatic stop on feed which prevents the breaking of feed connection. Drill 0 to $1\frac{1}{2}$ inch hole, and to center of 21 inch circle. Weight, 305 lbs.

Without Pulleys	\$75 00
With Tight and Loose Pulleys, 10 inch diameter, $2\frac{1}{2}$ inch face	79 00
With Cone Pulley (see illustration of No. 4 Drill) and Countershaft to match	105 00

No. 4 DRILL.

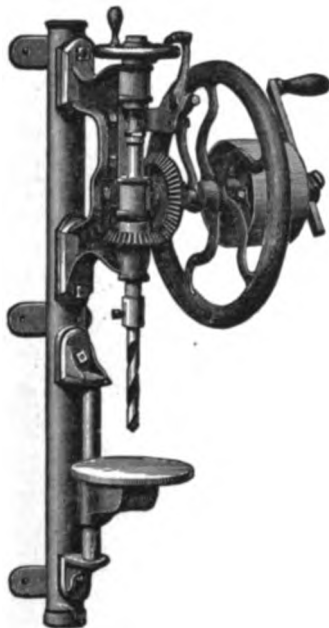
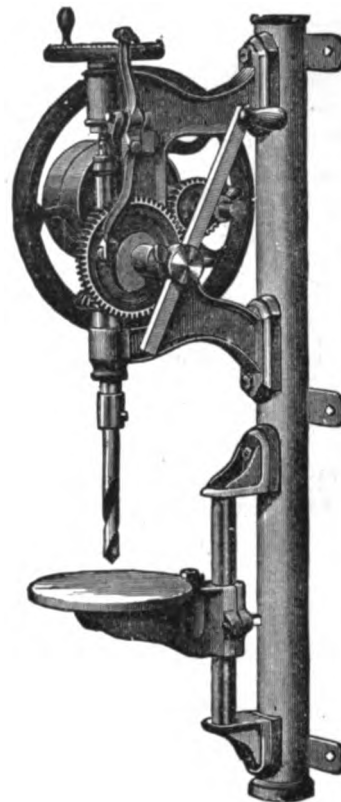
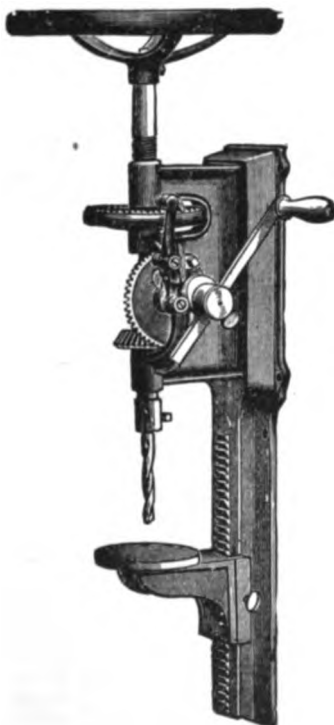
No. 4 has cut gears arranged as No. 3, for fast or slow motion. The spindle, not being burdened with the weight of the balance wheel, is quickly operated by the hand wheel in front. Nos. 3 and 4, when used with three-step cone pulley, have six changes of speed. Drills to center of $17\frac{1}{2}$ inch circle. Weight, 250 lbs. Spindle for $\frac{1}{4}$ inch straight shank drill. Size of driving pulley, $10 \times 2\frac{1}{2}$ in. Cone pulley, three-step, 10 in., 8 in., 6 in. and $2\frac{1}{4}$ in. face.

For Hand only	\$ 70 00
With Tight and Loose Pulleys (see illustration No. 3)	74 00
With Cone and Countershaft to match	100 00

No. 5 DRILL.

No. 5 has our patent tubular iron column, by the use of which it is more easily bolted in position to post or wall than those having a wood back. Otherwise it is the same as our No. 1 $\frac{1}{2}$. Length, 46 inches. Weight, 135 lbs.

Price	\$36 00	With Pulleys	\$39 00
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UPRIGHT SELF-FEEDING DRILLS.**No. 6.****Plate 1214.****No. 7.****Plate 1215.****No. 10. THE BOSS.****Plate 1216.****NO. 6 DRILL.**

The No. 6 Drill has our patent tubular iron column. Otherwise same as No. 1 Drill. Drills from 0 to 1 inch hole, and to center of 11 inch circle. Spindle takes $\frac{1}{2}$ inch straight shank drills. Length, 42 inches. Weight, 125 lbs.

With pulleys for power \$33 00
For hand only, without power 30 00

NO. 7 DRILL.

The No. 7 Drill has a tubular iron column, otherwise same as our No. 2 Drill, and is especially recommended for use in factories, agricultural works, machine shops, or other places where an upright drill is required, answering the purpose equally as well as the high cost machine. Spindle fitted for $\frac{1}{2}$ inch straight shank drills. Drills from 0 to $1\frac{1}{2}$ inch hole, and to center of 15 inch circle. Pulleys, 8 inch diameter, $2\frac{1}{2}$ inch face. Weight, 200 lbs.

As arranged above, for both hand and power \$56 00
For hand only 52 00

NO. 10 DRILL.

The frame is all iron, cast in one piece. It is strong, very light running, and easily handled. The feed arm has a run of 4 inches, and three rates of speed. Can be used as a horizontal, if desired. Drills from 0 to $\frac{7}{8}$ inch hole and to center of 11 inch circle. Spindle takes $\frac{1}{2}$ inch straight shank drills. Length, 44 inches. Weight, 100 lbs.

Price \$25 00

UPRIGHT SELF-FEEDING AND POWER DRILLS.

No. 11.

UPRIGHT SELF-FEEDING DRILL.

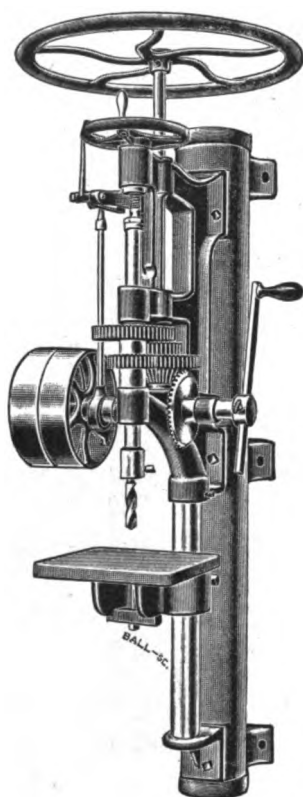


Plate 1217.

No. 12.
UPRIGHT POWER DRILL.
LEVER FEED.

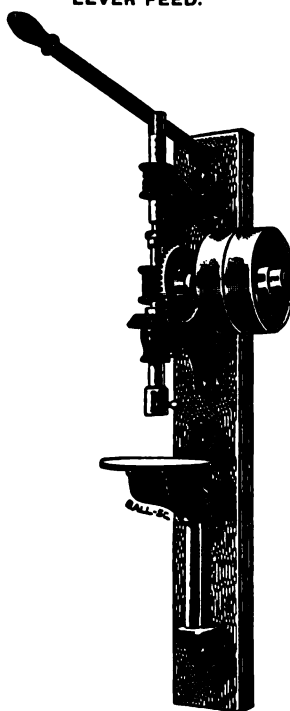


Plate 1218.

No. 13.

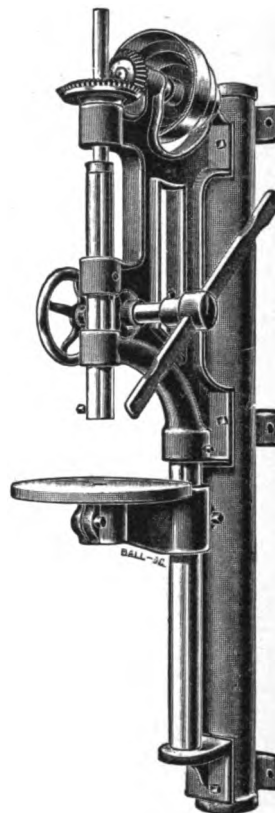
UPRIGHT POWER DRILL.
LEVER FEED.

Plate 1219.

No. 11 DRILL.

This Machine is the same as our No. 3 Machine, but is fastened to our patent tubular iron column instead of a wood plank; and is more readily placed in position on post or wall, and is very rigid in position. Weight, 355 pounds.

With tight and loose pulley \$84 00
For hand only 80 00

No. 12 DRILL.

Plate 1218 is arranged for power with lever feed. A very useful tool for quick and light drilling, for carriage and other wood-working shops. Drills from 0 to 1 inch hole, and to 11 inch circle. Spindle takes $\frac{1}{2}$ inch straight shank drills. Length, 43 inches. Weight, 75 pounds.

Price \$28 00

No. 13 DRILL.

Plate 1219 represents a Power Drill with lever feed fastened to iron tubular column. It is a very suitable machine for blacksmith and other shops where power is used. It is furnished with a square table and forked foot piece, as shown in cut of our No. 3 Drill, or with round table and foot piece as shown in above cut, as desired. Drills to the center of 19 inch circle. Greatest distance between table and spindle, 21 inches; traverse of spindle, 8 inches; has $\frac{1}{4}$ inch hole in spindle for straight shank drills, or can be furnished with taper hole if desired. Three step cone pulley, $8\frac{1}{2}$, $6\frac{1}{2}$, $4\frac{1}{2}$ inches for $2\frac{1}{4}$ inch belt. Tight and loose pulley on countershaft, $10 \times 2\frac{1}{2}$ inches. Length, 63 inches. Weight, 330 pounds. With countershaft \$80 00

UPRIGHT POWER DRILLS.

NO. 14. UPRIGHT POWER DRILL.

LEVER FEED. 22 INCH SWING.

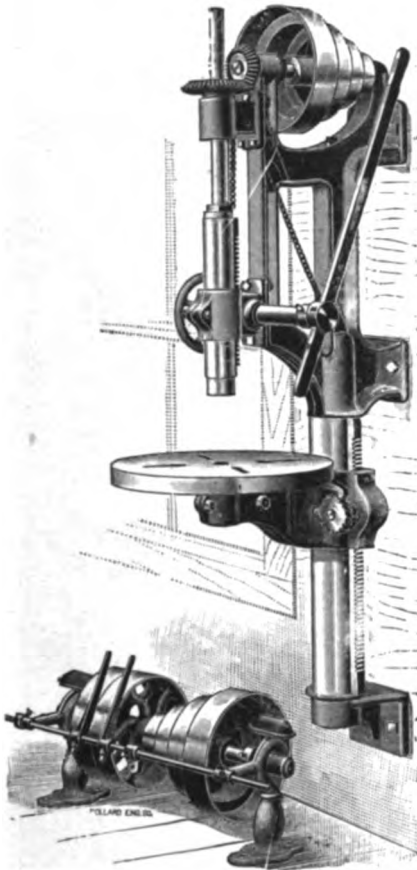


Plate 1220.

NO. 14. UPRIGHT POWER DRILL.

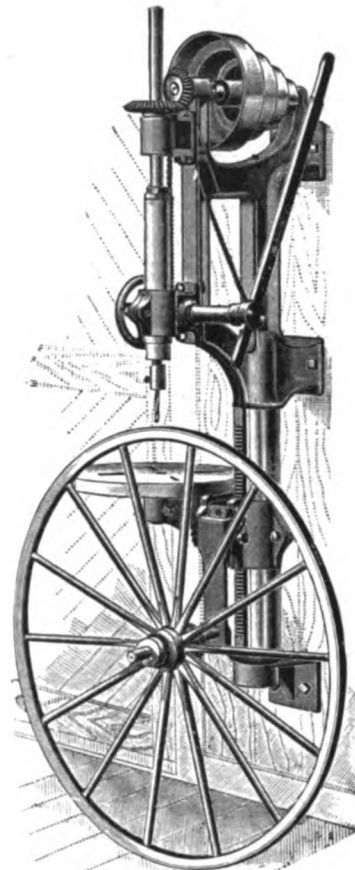


Plate 1221.

NO. 14 DRILL—PLATE 1220.

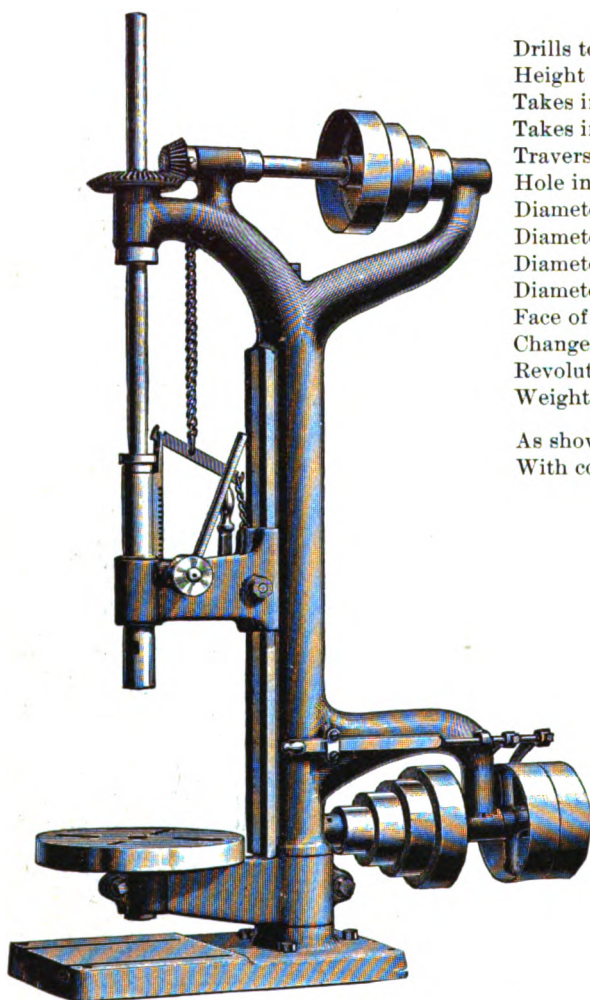
The machine represented by Plate 1220 is adapted to the wants of machine and other shops desiring a first-class drill of large capacity, so constructed as to require the least possible space for its occupancy. It has strong and heavy brackets, and when bolted to post or wall is very rigid in position. It is made with screw and lever feed, combined or singly. It is fitted with four-step Cone Pulley of large dimensions for 2½ inch Belt, which will give good variety of speeds. It has a very large Revolving Table properly slotted for bolting work to same. The hole in steel Spindle (which is counterbalanced) is fitted for Morse Taper No. 3, although sockets for taking chucks, square or straight shank drills are furnished at a small advance in cost, when desired. Distance from post to center of Table, 11 inches. Diameter of Table, 19 inches. Greatest distance between Table and Spindle, 23¼ inches. Vertical traverse of Table, 18 inches. Vertical traverse of Spindle, 10 inches. Diameter of Cone Pulley, 11 inches, 8½ inches, 6½ inches, and 4 inches for 2½ inch Belt. Diameter of tight and loose pulleys, 10 inches for 3 inch Belt. Revolutions per minute, 230. Entire length of Drill, 67 inches. Weight, 500 lbs.

With Countershaft and Lever Feed	\$125 00
With Countershaft and Screw Feed	180 00
With Countershaft, Lever and Screw Feed combined	185 00

NO. 14 DRILL—PLATE 1221.

Plate 1221 represents our No. 14 Drill for blacksmiths and carriage makers, being fitted with a Removable Wheel holding attachment, on which Wheels are quickly revolved when drilling holes in tires. Wheels of various dimensions can be brought in contact with Drill Bit by raising or lowering the Table to which the Wheel Holder is attached. Wheel Attachment..... \$5 00

In all other respects it is the same as Drill represented by Plate 1220.

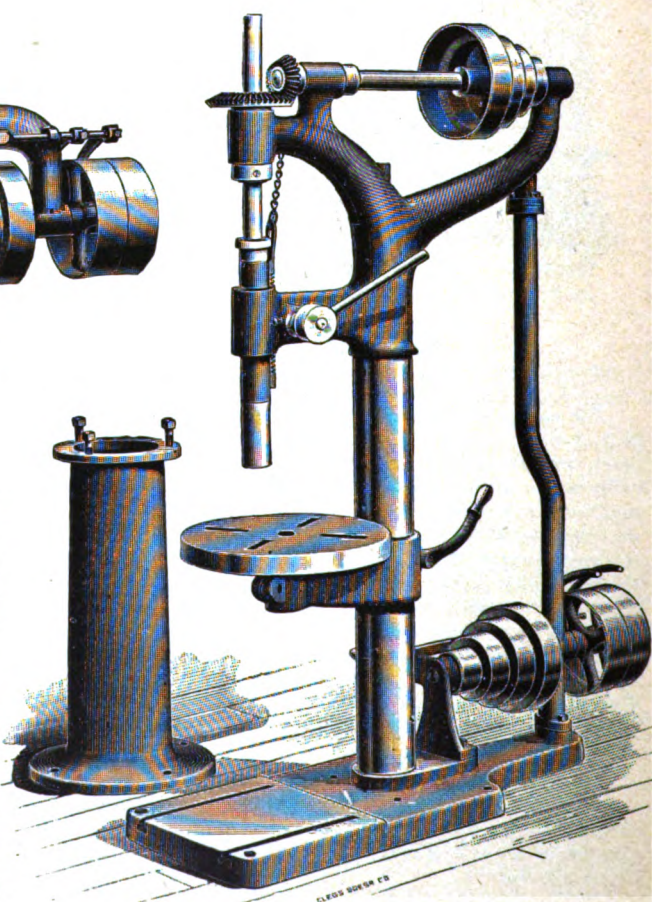
BENCH DRILLS.**14 INCH BENCH DRILL.****WITH SLIDING HEAD.****Plate 1222.****15 INCH BENCH DRILL**

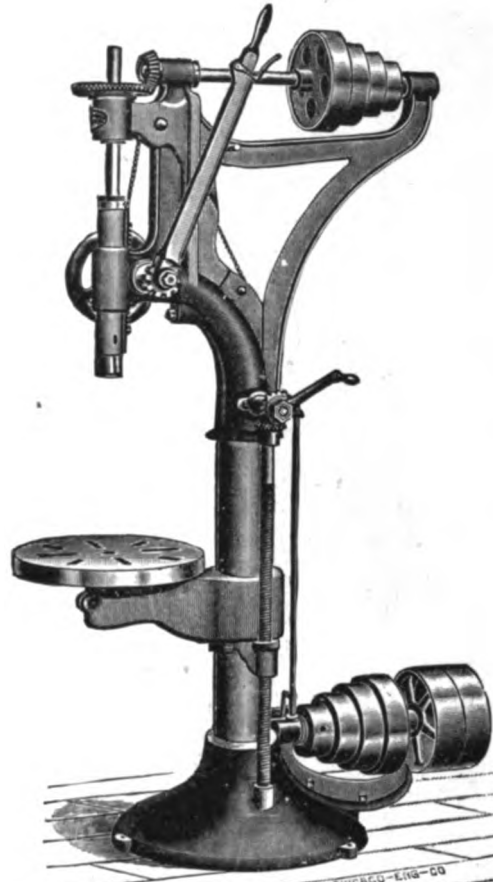
Drills to center of	15 in.
Height over all with extra col.	6 ft.
Ht. over all without extra col.	4 ft. 2 in.
Takes in bet. base and spindle	24 in.
Takes in bet. table and spindle	18 in.
Traverse of spindle	5 in.
Hole in Spindle fits Morse Taper No. 2.	
Diameter of spindle	1 $\frac{1}{8}$ in.
Diameter of column	3 $\frac{1}{2}$ in.
Diameter of table	12 in.
Diameter of driving pulley	7 in.
Changes of speed, cone driving pulley	4
Rev. of lower shaft per min.	350
Weight of drill	300 lbs.
With Column	\$48 00
Without Column	43 00

14 INCH BENCH DRILL.

Drills to center of	14 in.
Height over all	4 ft. 2 in.
Takes in between base and spindle	25 in.
Takes in between table and spindle	18 in.
Traverse of spindle	4 $\frac{1}{2}$ in.
Hole in spindle fits Morse Taper No. 2.	
Diameter of spindle	1 $\frac{1}{8}$ in.
Diameter of column	4 in.
Diameter of table	12 in.
Diameter of driving pulley	7 in.
Face of driving pulley	2 in.
Changes of speed, cone driving pulley	3
Revolutions of lower shaft per minute	350
Weight, about	300 lbs.

As shown in cut	\$50 00
With column for floor use	55 00

15 INCH BENCH DRILL.**Plate 1223.**

RUMSEY WHEEL AND LEVER FEED DRILLS.**20 INCH WHEEL FEED.
SQUARE BASE DRILL.****Plate 1224.****20 INCH LEVER FEED,
ROUND BASE DRILL.****Plate 1225.**

The above cuts illustrate our Rumsey 20 Inch Upright Drills.

The wheel feed drills have quick return. By throwing out the worm, the quick return lever can be used as a lever for light drilling or counter sinking. All gears and racks are cut; pinions and all parts subjected to severe strain are steel.

The hole in spindle is fitted to Morse Taper No. 3, unless otherwise ordered. The table has slots for bolting on work and revolves in arm. Arm revolves around column, and is raised and lowered by rack and pinion in the usual manner.

Cone pulleys have four changes of speed and are for 2 inch belt.

Traverse of table	21 inch
Feed of spindle	8 inch
Greatest distance from end of spindle to floor	42 inch
Diameter of table	16 inch
Driving pulleys, tight and loose	9¼ x 2¾ inch
Revolutions	250
Weight	550 lbs.
Price, Round Base Lever Feed	\$88 00
Price, Square Base Wheel Feed	95 00

20 INCH PLAIN UPRIGHT DRILL.

WITH SLIDING HEAD AND QUICK RETURN.

Not made with Back Gear or Power Feed.



Plate 1226.

Drills to center of	20 in.
Height over all	6 ft.
Takes in between base and spindle	40 in.
Takes in between table and spindle	27 in.
Traverse of table	12 in.
Hole in spindle fits Morse Taper No. 3.	
Diameter of spindle	1 $\frac{5}{8}$ in.
Diameter of column	5 in.
Diameter of table	16 in.
Diameter of driving pulley	9 in.
Face of driving pulley	2 $\frac{1}{2}$ in.
Changes of speed, cone driving pulley	4
Revolutions of lower shaft per minute	300
Weight, about	700 lbs.
Price, as shown	\$100 00

21 INCH UPRIGHT DRILL PRESS.

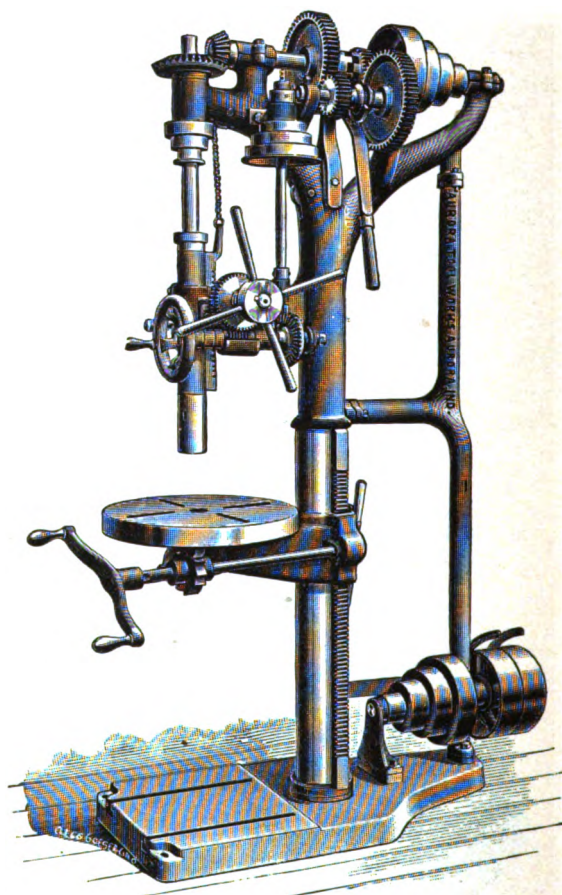
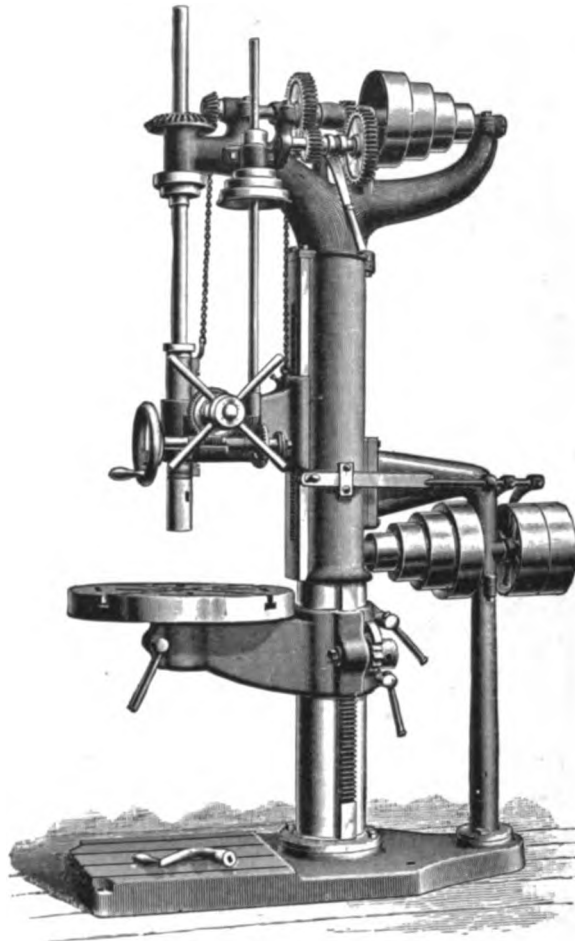
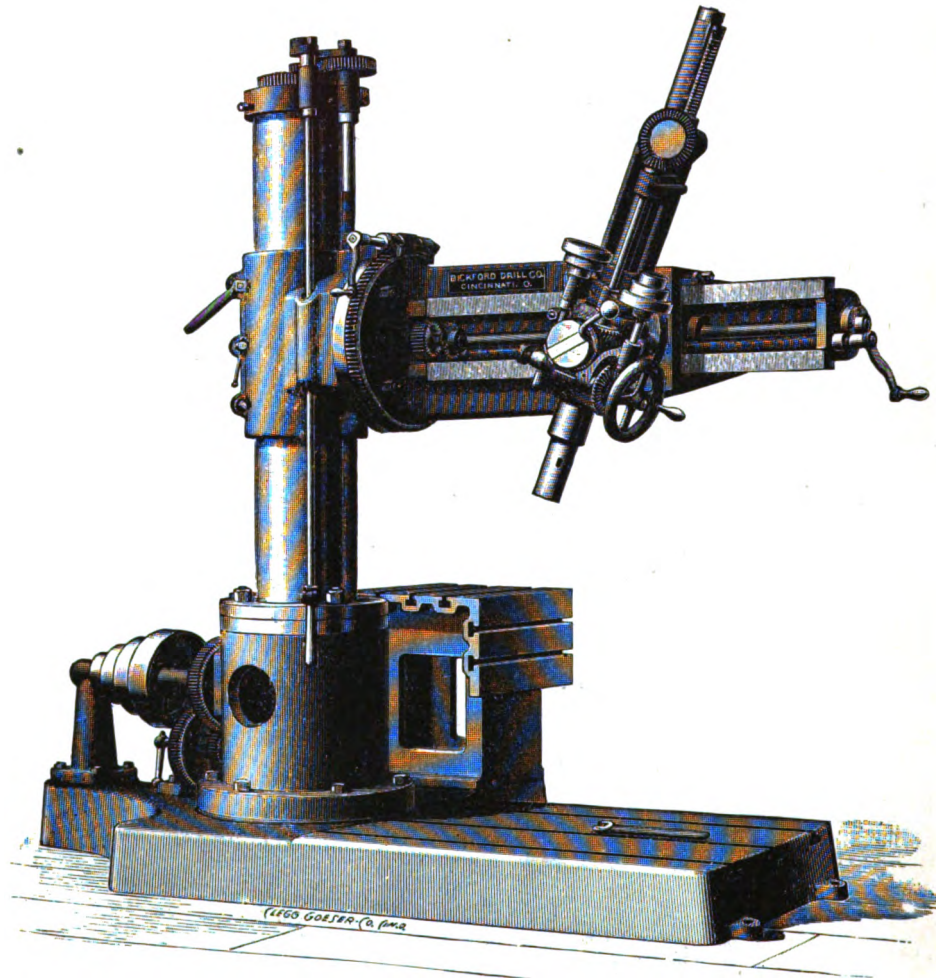


Plate 1227.

Drills to center of	21 in.
Height over all	6 ft.
Takes in between base and spindle	38 in.
Takes in between table and spindle	32 in.
Traverse of table	24 in.
Hole in spindle fits Morse Taper No. 3.	
Diameter of spindle	1 $\frac{5}{8}$ in.
Diameter of column	5 in.
Diameter of table	16 in.
Diameter of driving pulley	9 in.
Face of driving pulley	2 $\frac{1}{2}$ in.
Changes of speed, cone driving pulley	4
Revolutions of lower shaft, per minute	300
Weight, about	700 lbs.
Price, plain lever and worm feed	\$ 70 00
Price, with power feed and automatic stop.	80 00
Price, with back gear, power feed and automatic stop	110 00

NEW AND IMPROVED 24 INCH UPRIGHT DRILL PRESS.**BACK GEARED AND POWER FEED UPRIGHT DRILL.****WITH BACK BRAKE, GIBBED SLIDING HEAD, AND PATENT QUICK RETURN OR PATENT AUTOMATIC STOP.****Plate 1228.**

Dimensions	{	24 Inch Drill	28 Inch Drill	32 Inch Drill	40 Inch Drill
Drills to center of		24 inch	28 inch	32 inch	40 inch
Height over all	7 feet	4 inch	8 feet	8 feet	9 feet
Takes in between base and spindle		48 inch	50 inch	50 inch	51 inch
Takes in between table and spindle		34 inch	38 inch	38 inch	37 inch
Traverse of spindle (automatic feed)		9 inch	10 inch	10 inch	13½ inch
Traverse of table		17 inch	15 inch	15 inch	13½ inch
Hole in spindle fits Morse Taper		No. 4	No. 4	No. 4	No. 5
Diameter of spindle		1½ inch	1¾ inch	1¾ inch	2½ inch
Diameter of column		7 inch	8½ inch	8½ inch	9 inch
Diameter of table		22 inch	25 inch	25 inch	31 inch
Diameter of driving pulley		10 inch	12 inch	12 inch	12 inch
Face of driving pulley		3 inch	3 inch	3 inch	3 inch
Changes of speed, cone driving pulley		4	4	4	4
Revolutions of lower shaft per minute		275	275	275	275
Weight, about		1,500 lbs.	2,200 lbs.	2,400 lbs.	3,600 lbs.
Price, plain		\$150 00	\$200 00	.....	.....
Price, back gears only		175 00	225 00	\$250 00	\$400 00
Price, back gears and power feed and auto- matic stop		190 00	245 00	270 00	430 00

FULL UNIVERSAL RADIAL DRILLS.**STYLES B AND C.****Plate 1229.**

	STYLE B.	STYLE C.
Diameter of column	11 inches	14 inches.
Distance from floor to highest point of column	8 feet 2 inches	10 feet.
Distance from elevating screw to center of drill spindle when at the extreme point of arm	4 feet 6 inches	5 feet 6 inches.
Drills to the center of a circle of	9 feet	11 feet.
Vertical range of arm on column	2 feet 10 inches	4 feet.
Receives under spindle, over base	4 feet 10 inches	6 feet 6 inches.
Receives under spindle, over floor	5 feet 5 inches	7 feet 2 inches.
Height of table above base	2 feet	2 feet 4 inches.
Size of table	20 x 20 inches	28 x 28 inches.
Spindle bored to fit Morse taper No	4	5.
Diameter of spindle	2 $\frac{1}{4}$ inches	2 $\frac{1}{2}$ inches.
Traverse of spindle.	16 inches	20 inches.
Size of tight and loose pulleys	14 x 3 $\frac{1}{2}$ inches	16 x 3 $\frac{1}{2}$ inches.
Speed of countershaft	250 revolutions	200 revolutions.
Width of belt for cone pulley	3 inches.	3 inches.
Floor space for base	4 ft. 8 in. x 8 ft.	6 ft. 10 in. x 9 ft. 8 in.
Weight of drill, about	6,000 pounds	11,000 pounds.

Write for cuts and descriptions of other styles and sizes.

80-INCH RADIAL DRILL. WITH AUTOMATIC STOP.

The accompanying cut represents our 80-inch Radial Drill, new in design and construction. The machine is very stiff; the standard or column of a box girder form, and bolted to the base-plate. A saddle gibbed to the front face of column and the Radial Arm journaled to the saddle, so that the Radial Arm can swing over half a circle. The saddle, with arm, can be raised or lowered by power and has automatic stop. The machine is driven from a countershaft. Cone pulley shaft next to the base-plate and journaled through the column. The upright shaft is operated by bevel gears from cone pulley shaft and runs through center of Radial Arm journal, from where upright shaft communicates motion to Drill Spindle, also through tumbler gearing to the screw to raise and lower the arm by power. The Drill Head is gibbed upon the Radial Arm and is adjusted to any position on the arm by means of crank and screw. The Drill Spindle has Automatic Stop.

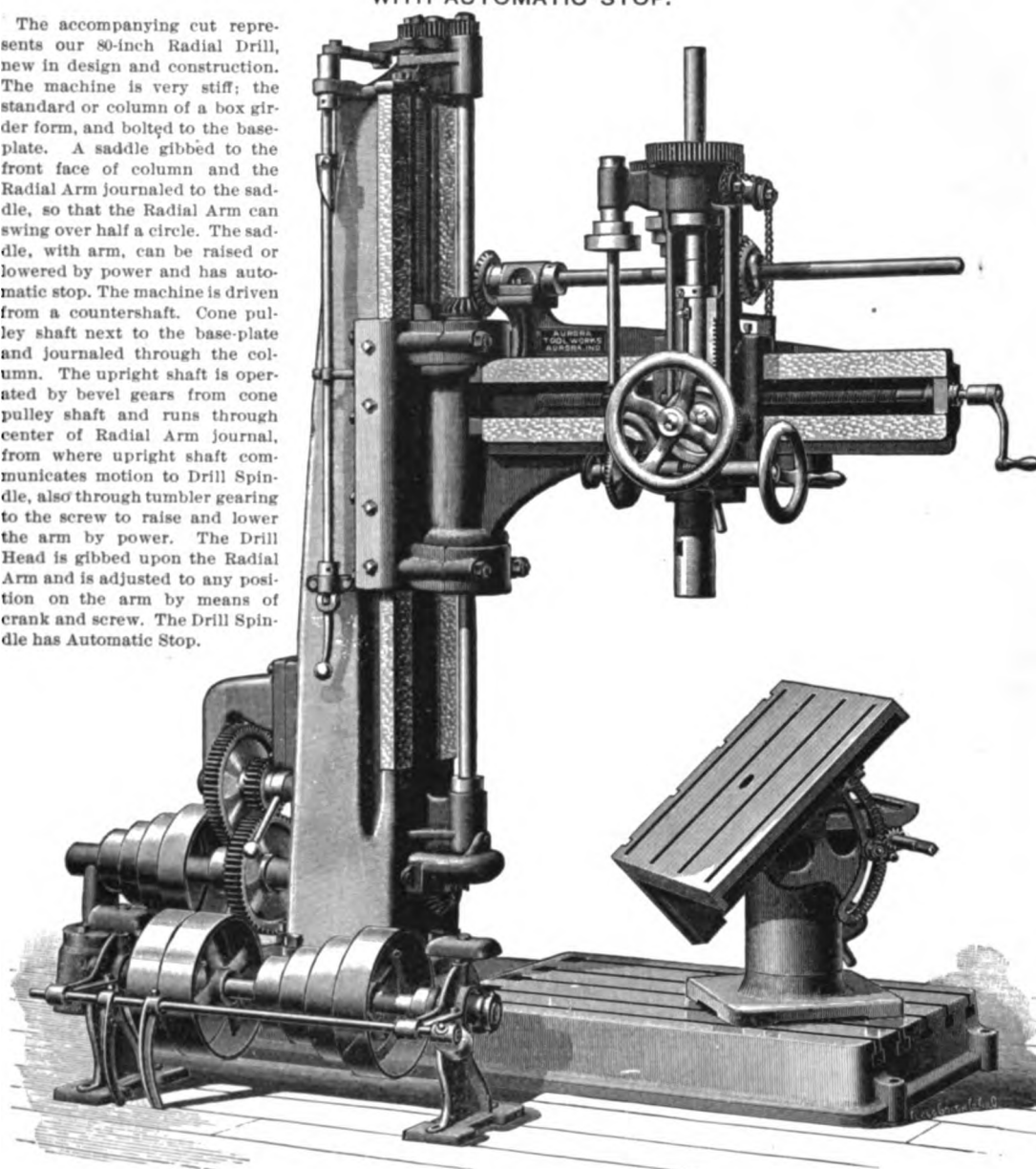
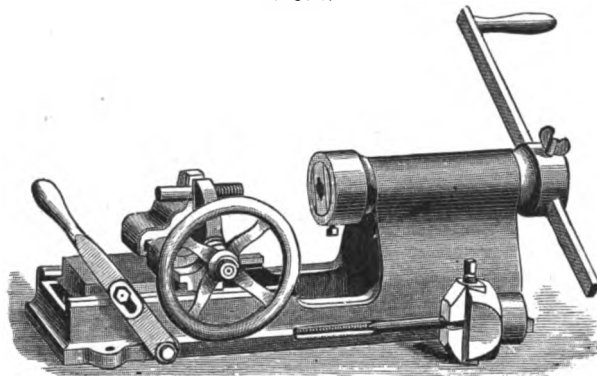


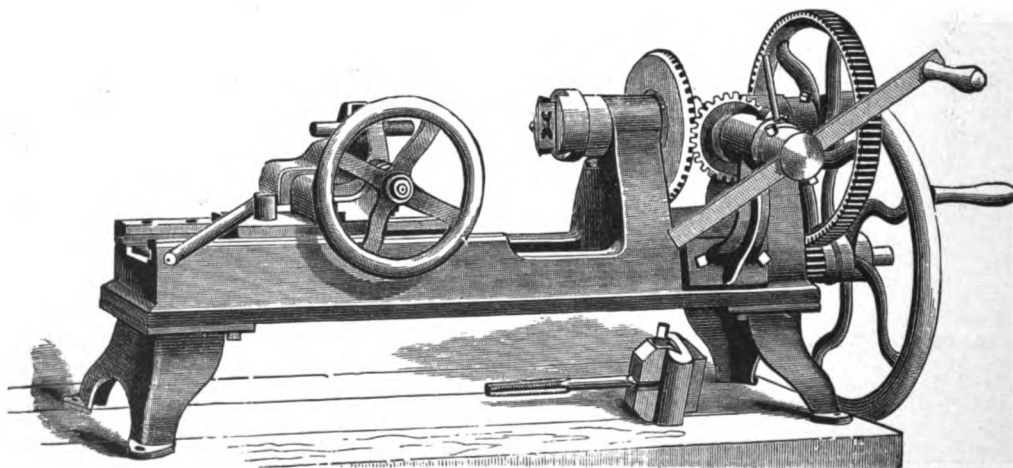
Plate 1230.

Drills to center of	80 inches
Height over all	8 feet
Distance between Base and Spindle	57 inches
Hole in Spindle Morse Taper	No. 4
Diameter of Spindle	1 1/4 inches
Movement Arm on column	33 inches
Movement Drill Spindle	16 inches
Changes on Cones	4
Face of Cones	4 inches
Tight and Loose Pulleys on Countershaft	16 x 4
Speed of Countershaft	120
Weight, complete	4000 lbs.
Height of Table	29 inches
Top Face of Table	22 x 22
Side Face of Table	22 x 11
Weight of Table	500 lbs.

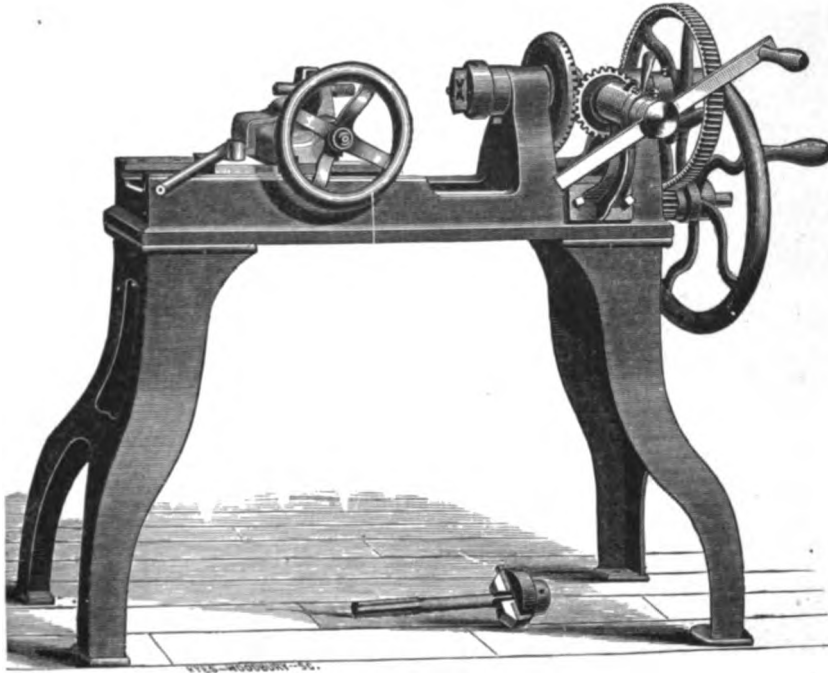
BOLT CUTTER AND NUT TAPPER.**No. 1.****Plate 1231.**

No. 1, with 7 taps and dies to match, cutting $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ inch. Solid or adjustable dies furnished, as desired.

Weight, complete . . . . .	. 98 lbs.
Cuts	$\frac{1}{4}$ to $\frac{3}{4}$ inch.
Price	\$60 00

WITH SHORT LEGS.**No. 2.****Plate 1232.**

No. 2 is fitted to cut 9 sizes, as follows: $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 in., complete, with Solid Dies, \$95 00
 With Adjustable Dies 98 00

NO. 2 HAND BOLT CUTTER.**LONG LEGS.****Plate 1233.**

The above represents our No. 2 Hand Machine mounted on Long Legs. Cuts from $\frac{1}{4}$ to 1 inch.

Without Taps and Dies	\$ 70 00
With Taps and Solid Dies, cutting $\frac{1}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ and 1 inch	100 00
With Taps and Adjustable Dies as above	108 00

Our No 2½ Hand Machine cuts from $\frac{1}{8}$ to $1\frac{1}{4}$ in. Weight 345 lbs.

Without Taps and Dies	\$ 70 00
With Taps and Solid Dies, for cutting $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$ and $1\frac{1}{4}$ inches	113 00
With Taps and Adjustable Dies as above	120 00

NO. 3 POWER BOLT CUTTER AND NUT TAPPER.

Cuts $\frac{3}{8}$ to $1\frac{1}{2}$ inch. Weight, complete, 500 lbs.

The above is fitted with eleven Taps and Dies, cutting $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$ and $1\frac{1}{2}$ inches, rough iron size. The Cone Pulleys carry a 3 inch Belt. The Driving Pulleys are 10 inches, and will carry a $2\frac{3}{4}$ inch Belt.

With Countershaft	\$165 00
Adjustable Dies, extra	10 00

Write for Catalogue on Wood and Iron Working Machinery.

THE SCHLENKER BOLT CUTTER.

SINGLE HEAD, Nos. 5 TO 8.

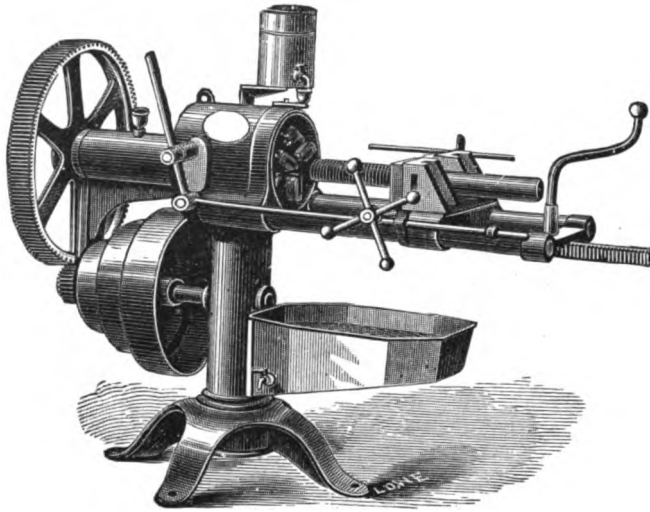


Plate 1234.

No. 4 DOUBLE-HEADED BOLT CUTTER.

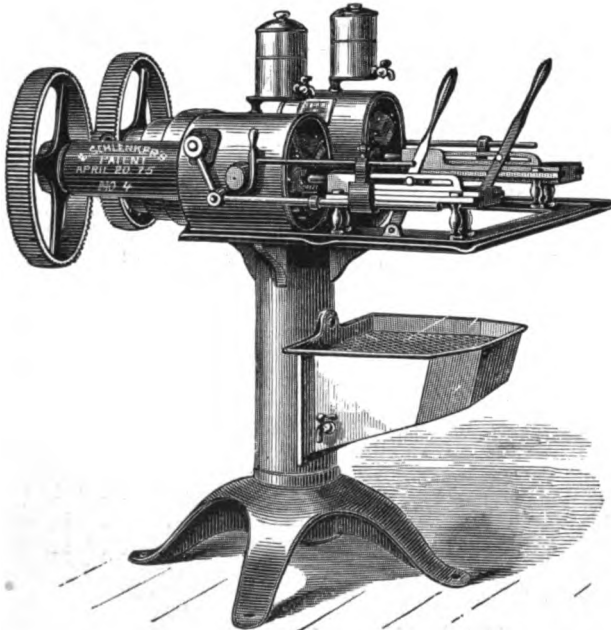


Plate 1235.

In the Schlenker Bolt Cutters the dies are opened automatically when the desired length of thread has been cut on the bolt, and are closed by the lever, or automatically, as shown in the cut of machine. It can be changed from one size to another in less than a minute without removing a bolt or pin. It does not require skilled labor, but can be operated by any competent boy. The dies are arranged to open and close automatically, therefore do not require the constant attention of the operator. It is a very rapid worker, its capacity being from 3,500 to 4,000 $\frac{5}{8}$ inch bolts with $1\frac{1}{2}$ inches of thread, per day, and larger bolts in proportion. Threads cut by these machines will not vary one-half thread in length on ten thousand bolts. The machines are simple in construction, very compact and strongly built, and are offered much below the price of any other machines capable of cutting the same sizes, and amount of work. It is adapted to cut right and left hand V threads, square threads and coach screws; will take in crooked as well as straight work, and cut any length of bolt. The machines are now largely in use, and we offer them to the trade as one of the most complete machine tools in the market.

No. 5	cuts from $\frac{1}{4}$ to $1\frac{1}{4}$ inclusive,	9 set of Dies.	Weight, 950 lbs.	Price	\$275 00
No. 5½	cuts from $\frac{3}{8}$ to 2 inclusive,	14 set of Dies.	Weight, 1,700 lbs.	Price	400 00
No. 6	cuts from $\frac{3}{8}$ to 3 inclusive,	18 set of Dies.	Weight, 2,600 lbs.	Price	750 00
No. 7	cuts from $\frac{3}{8}$ to 3 inclusive,	18 set of Dies.	Weight, 2,750 lbs.	Price	810 00
No. 8	cuts from $\frac{3}{8}$ to 3 inclusive,	14 set of Dies.	Weight, 2,800 lbs.	Price	650 00
No. 4, Double-Headed,	cuts from $\frac{1}{4}$ to $\frac{3}{8}$ inclusive,	16 set of Dies.	Weight, 1,550 lbs.	Price	400 00

No. 7 has Nut-Tapping Combination, and is, in fact, two machines in one. Nuts can be Tapped and Threads cut at the same time.

Nos. 6 and 7 have Oil Pumps instead of Can.

Price includes Dies, Master Taps or Hobs, Nut Tap Holders, Dies and Steel Chucks for Nut Tapping, and Countershaft complete, but not Nut-Taps.

Extra Dies, Chucks and Taps furnished promptly.

NATIONAL BOLT CUTTERS.

ADVANTAGES CLAIMED.

1. Strongest and most durable Head.
2. Easiest operated Head, and simplest in construction, being composed of but three principal parts, viz., Barrel, Die Ring and Clutch Ring.
3. Head has best mechanical motion of any made.
4. Rapidity with which Dies can be changed from one size to another.
5. Right and left hand threads can be cut with the same Head, requiring only the changing of Dies.
6. Perfect and positive adjustment, the dog movement insuring against any possibility of lost motion after Dies are placed in position and Head closed, thereby enabling threads to be cut to the correct size without variation.
7. Four styles of Dies: Plain, Hat, Case and Flush Case.
8. Unparalleled accuracy and rigidity of Case and Flush Case Dies, the Cases being held inside of a Ring and Chasers in cases, decreasing the possibility of spring to a minimum.
9. Great economy of Case Dies, the Chasers being plain pieces of steel cut off the bar and hobbled in the cases, and can be recut for the same size until entirely worn out, not possible with any other form of Die in the market.
10. Plain and Hat Dies (the equivalent, with the exception of the Case and Flush Case, of any style of Die made) cut in one Head fit any other of like size.
11. Case and Flush Cases made for one Head fit any other of the same size, but the Chasers we advise to be cut in the Cases they are to be used in.
12. Chasers for Cases and Flush Cases can be made double end or reversible.
13. Flush Case Dies cut close to a shoulder, the only adjustable opening Die that will admit of this.
14. Barrel of Head made hollow and attached to hollow Spindles on Machine, allowing any length of thread to be cut.
15. Head made shorter, more compact, and does not overhang Spindle.
16. All parts subject to extreme wear made of Tool Steel and tempered.
17. Head made to standard Jigs and Gauges, and all parts interchangeable.
18. Simplest and most effective combined Hand and Automatic Opening attachment (patented), enabling the Head to be closed by means of the Carriage holding the Vise, or by separate Lever, and opened automatically or by hand without changing Automatic at any point.
19. Centering device on Vise Jaws (patented), enabling the latter to be kept true with Dies.

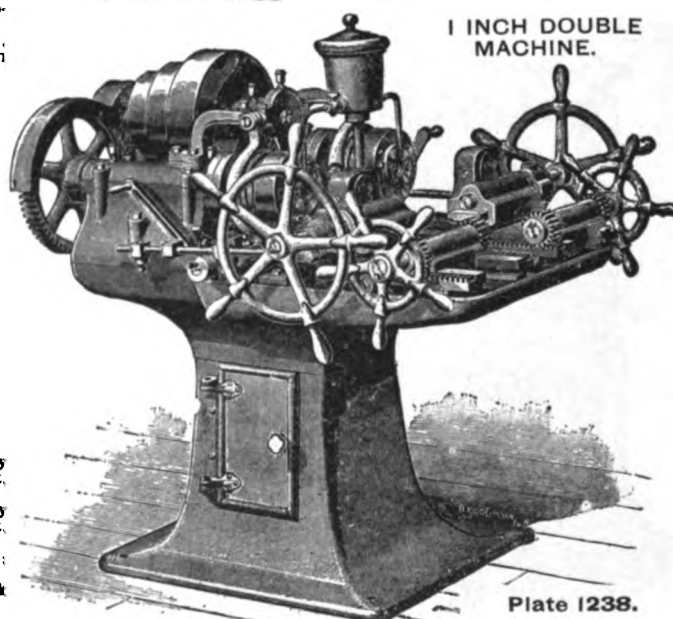
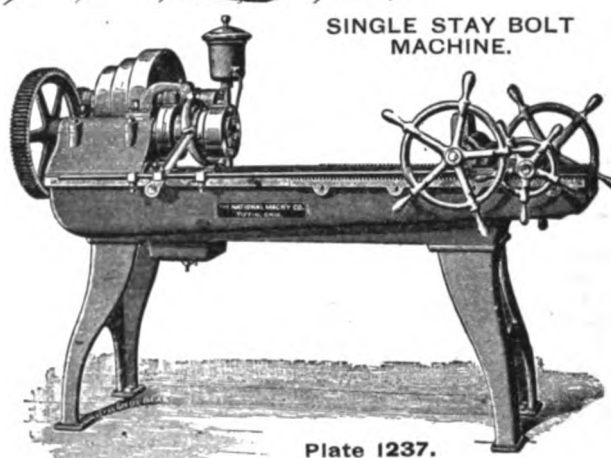
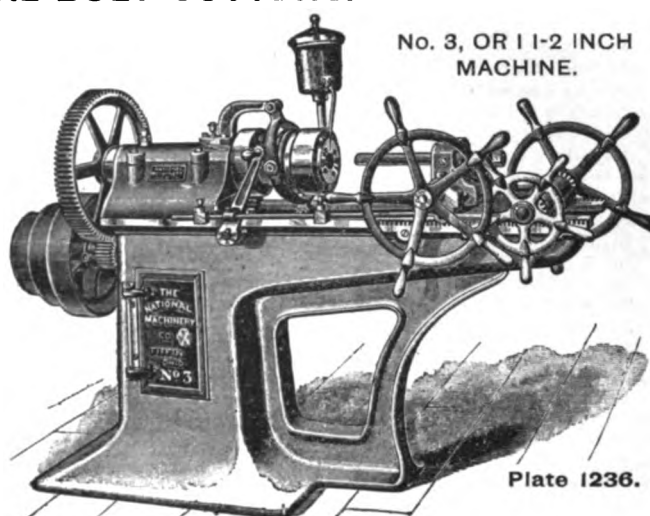
SINGLE MACHINES.

- No. 0. Capacity to $\frac{3}{4}$ inch; weight, 1,000 lbs.
 No. 1. Capacity to 1 inch; weight, 1,400 lbs.
 No. 2. Capacity to $1\frac{1}{4}$ inch; weight, 1,500 lbs.
 No. 3. Capacity to $1\frac{1}{2}$ inch; weight, 1,700 lbs.
 No. $3\frac{1}{2}$. Capacity to 2 inch; weight, 2,200 lbs.
 No. 4. Capacity to 2 inch; weight, 2,700 lbs.
 No. 5. Capacity to $2\frac{1}{2}$ inch; weight, 3,100 lbs.
 No. 6. Capacity to 3 inch; weight, 3,600 lbs.
 No. 7. Capacity to $3\frac{1}{2}$ inch; weight, 4,200 lbs.
 No. 8. Capacity to 4 inch; weight, 4,400 lbs.
 No. 9. Capacity to 5 inch; weight, 4,900 lbs.
 No. 10. Capacity to 6 inch; weight, 5,500 lbs.

DOUBLE MACHINES.

- 1 inch Double; weight, 2,200 lbs.
 $1\frac{1}{2}$ inch Double; weight, 2,500 lbs.
 2 inch Double; weight, 4,200 lbs.
 $2\frac{1}{2}$ inch Double; weight, 4,500 lbs.
 Single Stay, capacity to $1\frac{1}{2}$ inch; cutting any length to 36 inches without revising; weight, 1,900 lbs.
 Double Stay, capacity to $1\frac{1}{2}$ inch; cutting any length to 36 inches without revising; weight, 2,400 lbs.
 Independent Head Double; capacity to 1 inch; weight, 2,500 pounds.
 Also Single and Double Rapid and Double Track Bolt Cutters.

Photographs and prices upon application.



NATIONAL NUT TAPPERS.

BELT, CLASS B.

This Machine is substantial and durable in its construction, and designed to meet the demand for a cheap Machine, but one that will at the same time perform the work in a first class manner. The Spindles are held in babbitted boxes, and run true as a lathe spindle; are all independent of each other; have Springs to adjust the weight of same to size of Tap, and the Machine can be operated with the utmost facility.

- No. 1, 3 Spindle, taps to $\frac{3}{8}$ inch, weight, 500 lbs.
- No. 1, 4 Spindle, taps to $\frac{3}{8}$ inch; weight, 600 lbs.
- No. 2, 5 Spindle, taps to $\frac{3}{8}$ inch; weight, 900 lbs.
- No. 3, 3 Spindle, taps to $\frac{5}{8}$ inch; weight, 600 lbs.
- No. 4, 4 Spindle, taps to $\frac{5}{8}$ inch; weight, 800 lbs.
- No. 5, 5 Spindle, taps to $\frac{5}{8}$ inch; weight, 1,100 lbs.
- No. 6, 6 Spindle, taps to $\frac{7}{8}$ inch; weight, 2,200 lbs.

BELT, CLASS A.

This Machine has been designed with the greatest care, is strong and heavier than the Class B, and superior to any style of Belt Nut Tapper yet offered. The Treadles are supported on the Frame, and the Machine is thoroughly self contained. It has the very latest improvements, such as Side Frames in one piece, Deep Pan, with end arrangement for drawing off water and oil, and also a door for removing chips; the Spindles are held in babbitted boxes, are independent of each other and have Springs to adjust the weight of same to size of Tap.

- No. 1, 4 Spindle, taps to 7-16 inch; weight, 1,100 lbs.
- No. 2, 5 Spindle, taps to $\frac{3}{4}$ inch; weight, 1,200 lbs.
- No. 3, 6 Spindle, taps to 1 inch; weight, 2,600 lbs.

SKREW GEAR.

This Machine was originated to meet the demand for a Nut Tapper combining the good qualities of the Belt Machine without the inconvenience and expense attached to the latter in using Belts, which require tightening and renewing so often. The primary object of Skew Gear is to enable the Driving Shaft to be placed directly back of the Spindles holding Taps and between the Bearings of same. This Machine is thoroughly self contained, the Treadles being supported on the Frame, and is furnished with the very latest improvements, such as Side Frames in one piece, Deep Pan with the end of same arranged for drawing off water and oil, and door for removing chips; Springs to adjust weight of Spindles to size of Taps, and with the

- No. 1, 4 Spindle, taps to $\frac{1}{2}$ inch; weight, 1,200 lbs.
- No. 2, 5 Spindle, taps to $\frac{3}{4}$ inch; weight, 1,350 lbs.
- No. 3, 4 Spindle, taps to 1 inch or $1\frac{1}{4}$ inch on two Spindles, weight, 2,000 lbs.
- No. 4, 6 Spindle, taps to 1 inch or $1\frac{1}{4}$ inch on two Spindles, weight, 2,800 lbs.

BACK GEAR.

This style of machine is acknowledged by the users of this class of tools to be the most complete and perfect Nut Tapper yet produced. The long Pinion does away with the feather driving motion of the Skew Gear, and the power is applied between the Bearings on the driven Spindles. This Machine can be operated in or out of Back Gear, giving six changes of speed, and is furnished when wanted, at a reduction in price, without Back Gear. It is thoroughly self contained, the Spindles being supported on the Frame and furnished with the very latest improvements, such as Side Frames in one piece, Deep Pan with the end of same arranged for drawing off water and oil, and Door for removing chips, Springs to adjust weight of Spindles to size of Taps, and any of the Spindles can be stopped independent of the others.

No. 2, 6 SPINDLE BACK GEARED MACHINE.

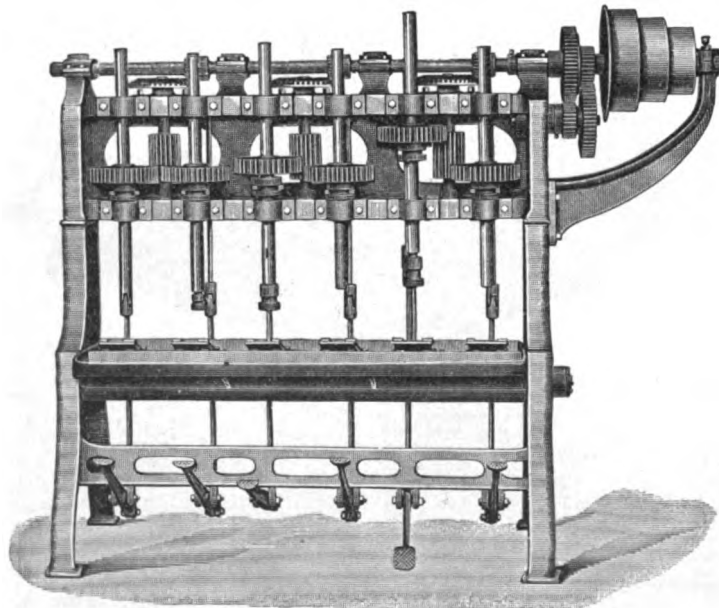


Plate 1240.

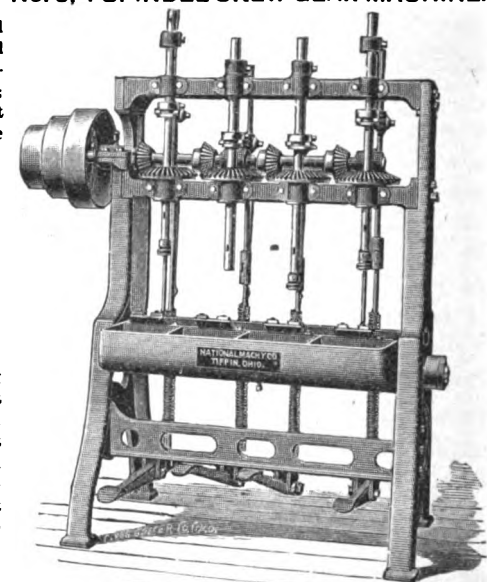


Plate 1239.

between the Bearings on the driven Spindles. This Machine can be operated in or out of Back Gear, giving six changes of speed, and is furnished when wanted, at a reduction in price, without Back Gear. It is thoroughly self contained, the Spindles being supported on the Frame and furnished with the very latest improvements, such as Side Frames in one piece, Deep Pan with the end of same arranged for drawing off water and oil, and Door for removing chips, Springs to adjust weight of Spindles to size of Taps, and any of the Spindles can be stopped independent of the others.

- No. 1, 4 Spindle, taps to $1\frac{1}{2}$ inch; weight, 2,800 lbs.

- No. 2, 6 Spindle, taps to $1\frac{1}{2}$ inch; weight, 3,500 lbs.

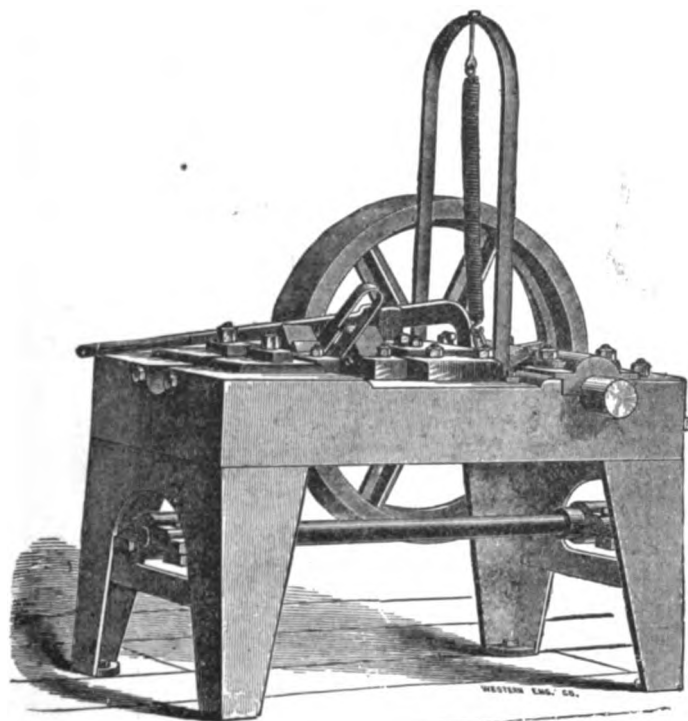
- No. 3, 4 Spindle, (extra heavy), taps to 2 inch; weight, 3,000 lbs.

- No. 4, 6 Spindle (extra heavy), taps to 2 inch; weight, 3,700 lbs.

Also 6 and 10 Spindle Rotary Automatic Tappers with capacity to $1\frac{1}{2}$ inch.

Tappers furnished with Plain, Patent Reclining, or Spring Sockets.

Photographs and prices upon application.

NATIONAL HEADERS.**CHAPIN.****Plate 1241.**

Cut shows Chapin Header; has been greatly improved since above was made.

This Machine is powerfully and substantially constructed, extremely efficient in its action and simple in operation, which is one of the particular points of excellence in its favor, requiring but little skill on the part of the operator. It is an admirable tool for various classes of bolts, such as carriage bolts, rivets, round heads of all descriptions and shoddy square head bolts for agricultural work. It is a machine that is used extensively by the railroads and in car and bolt works, some of the latter having as many as ten in operation. The grip dies are closed by a wedge attached to the header slide or cross head, the latter being set in motion by the lifting of the lever which engages the clapper with a tongue inserted in the shaft. A 2 inch hole is cast through the bed on each side partly to give denser metal and to allow two bolts being put through to strengthen it, or in the event of breakage.

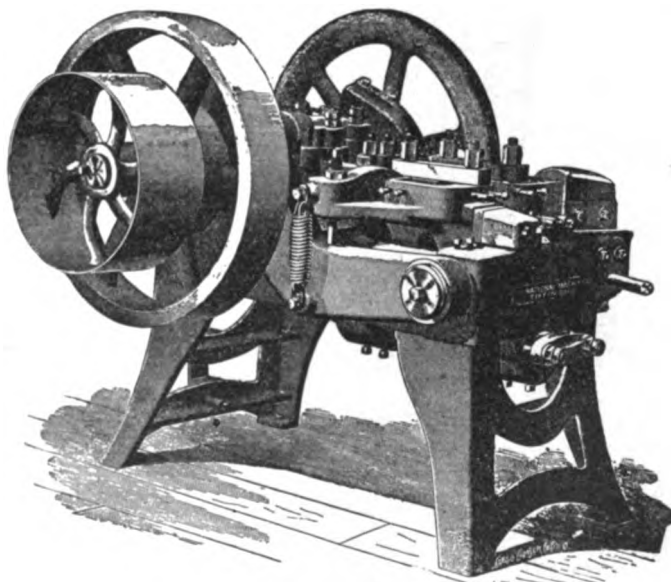
No. 1, capacity to $\frac{1}{2}$ inch; weight, 5,000 pounds.

No. 2, capacity to $\frac{3}{4}$ inch; weight, 6,500 pounds.

Special No. 2, capacity to $\frac{3}{4}$ inch; weight, 6,500 pounds.

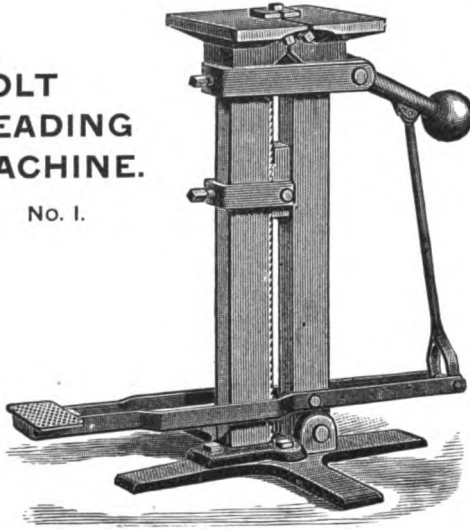
This is a well known form of Machine and is used almost exclusively in railroad, car and bolt shops as well as by others, the cam motion of it being particularly adapted for heading square and hexagon bolts, track bolts and rivets. The machine is constructed in the most substantial and durable manner, the Live Jaw and Header Slide being made of cast iron or cast steel as desired, and the Live Jaw Center Pin is made very large with ample provision for adjustment and lubrication and works in bronze centers. The machine weighs 7,500 pounds, and has a capacity on square and hexagon bolts to $1\frac{1}{2}$ inch, and on track bolts and rivets, which are made by feeding off the rod, to 1 inch. In the hands of an active operator it will head from 7,000 to 10,000 $\frac{3}{4}$ inch track bolts or rivets in ten hours, or 4,500 $\frac{3}{4}$ inch square head bolts, larger and smaller sizes in proportion, and is vastly superior to any bolt heading machine in the market in point of quality and quantity of output. Also Foot Bolt Headers with capacity to $1\frac{1}{2}$ inch. Stove Rod Header with capacity to $\frac{1}{2}$ inch. Improved and Advance Feed Burdick Headers with capacity to 2 inch. Heading and Upsetting Machines, class A and B, with capacity on bolts to 4 inch and upsets to 5 inch.

Photographs and prices upon application.

IMPROVED LEWIS.**Plate 1242.**

**BOLT
HEADING
MACHINE.**

No. 1.

**Plate 1243.**

These machines are a valuable tool in shops using bolts of any kind, as the time going to store for ready-made bolts and welding same to make a long bolt, is saved by making the Bolt Head on this machine. They are strongly built, and capable of standing a large amount of heavy work.

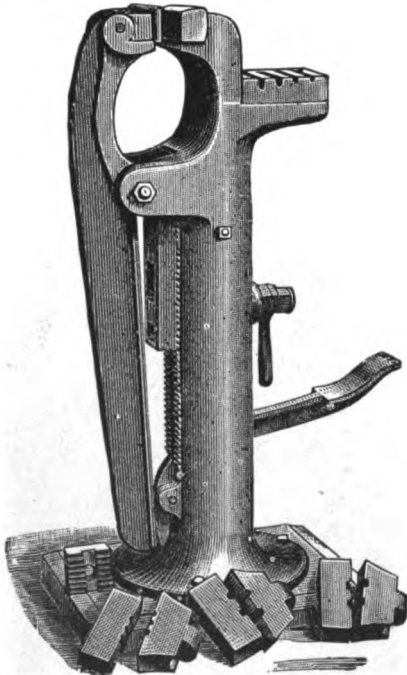
Weight, with Dies, 225 lbs.

With Cast Iron Dies, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{7}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 inch \$40 00
Steel Dies, each 2 00

FOOT VISE AND BOLT HEADER.

SIZE A.

Simple, Strong, Solid and Durable.

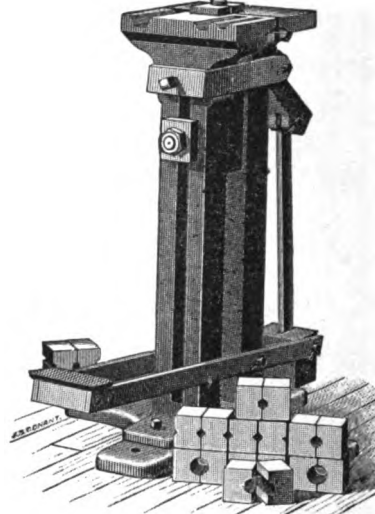
**Plate 1245.**

For forming, sharpening and welding calks on horse and ox shoes, for making Bolt Heads, and takes the place of an ordinary vise for bending and shaping hot iron, thus combining two machines in one. Weight, 165 lbs.

No. A, Complete, with Shoeing and Bolt Heading Dies \$20 00
No. B, without Shoeing Dies 17 00
No. C, without Bolt Heading Dies 17 00

BOLT HEADING MACHINE.

No. 2.

**Plate 1244.**

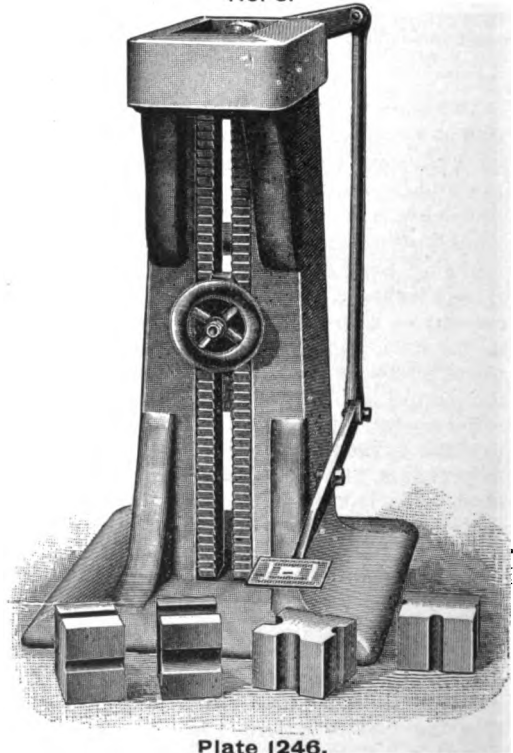
Will head bolts any length desired.

Weight, with Dies, 400 lbs.

With Cast Iron Dies, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{7}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 inch . . . \$60 00
Steel Dies, each 2 50

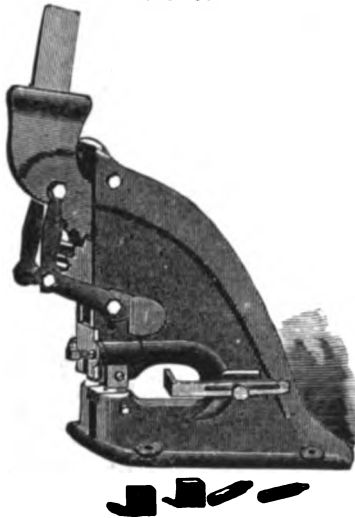
BOLT HEADER

No. 8.

**Plate 1246.**

This Bolt Header is intended for heavy work, and is furnished with steel dies for Heading Bolts from $\frac{1}{2}$ to 1 $\frac{1}{2}$ inches inclusive. Takes bolts to 26 inches long. A very strong machine.

Complete \$50 00

RICE'S PUNCHES.**No. 0.****Plate 1247.**

The most powerful hand punch known.
Will punch $\frac{1}{4}$ inch hole in $\frac{1}{8}$ inch iron, $2\frac{1}{4}$ inches from edge to center of hole. Will furnish $\frac{1}{8}$, 3-16, and $\frac{1}{4}$ inch die plate, with each machine.
Price \$10 00
Extra Punches, each 35
Extra Punch Blocks, 3 holes, each 45

No. 1.

Will punch 3-16 inch hole in 3-16 inch iron, 5-16 inch in $\frac{1}{8}$ inch iron, or $\frac{1}{2}$ inch in No. 14 wire gauge; 3 inches from edge. Will furnish $\frac{1}{8}$, 3-16 or $\frac{1}{4}$ dies and punches to match with each machine, unless otherwise ordered.
Price \$15 00
Extra Punch and Punch Blocks, each 45

No. 1 $\frac{1}{2}$.**Plate 1249.**

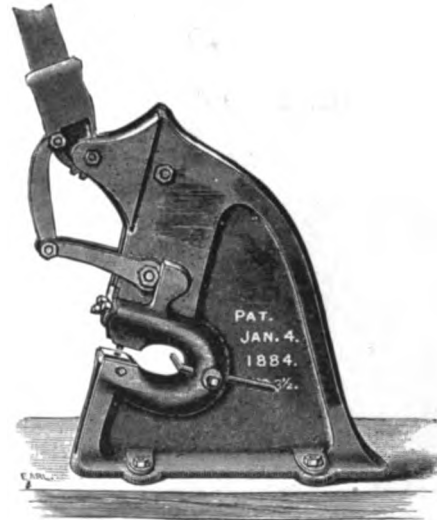
Is especially adapted for blacksmiths, punching steel tire and heavy work in general. Will punch $\frac{3}{8}$ inch hole in $\frac{1}{4}$ inch iron, $\frac{1}{2}$ inch hole in 3-16 inch iron, or $\frac{3}{8}$ inch hole in $\frac{1}{8}$ inch plate, 4 inches from edge. We furnish $\frac{1}{4}$, 5-16 and $\frac{3}{8}$ inch die plates, with punches to match, with each machine.
Price \$28 00
Extra Punches, from 3-16 to $\frac{1}{2}$ each 60
Extra Punches, from $\frac{3}{8}$ to 1 70
Extra Punch Blocks, each 1 00

No. 2 $\frac{1}{2}$.**Plate 1248.**

All we ask is a trial.
Expressly made for stove manufacturers, iron roofers, boiler makers, and heavy sheet iron workers.
One man can operate it with ease. It has two gauges, one for gauging holes same distance apart.

Will punch $10\frac{1}{2}$ inches from edge. It has only a 36 inch lever. Will punch $\frac{3}{8}$ inch hole in 3-16 inch iron, 5-16 inch hole in $\frac{1}{4}$ inch iron, and $\frac{1}{2}$ inch hole in $\frac{1}{8}$ inch iron, or $\frac{3}{8}$ inch hole in $\frac{1}{8}$ inch steel. Furnish 3-16, $\frac{1}{4}$ and 5-16 dies with punches to match with each machine, unless otherwise ordered.

Price \$40 00
Extra Punches and Punch Blocks, each 50

No. 3 $\frac{1}{2}$.**Plate 1250.**

In response to a large number of calls from the public for a machine that will punch a $\frac{1}{2}$ inch hole through $\frac{3}{8}$ inch iron, we have successfully designed and built our No. 3 $\frac{1}{2}$. In appearance it is the same as No. 1 $\frac{1}{2}$, except heavier. Will punch $\frac{1}{2}$ inch hole in $\frac{3}{8}$ inch iron, 9-16 inch hole in 5-16 inch iron, and $\frac{3}{8}$ inch hole in $\frac{1}{4}$ inch iron, $4\frac{1}{2}$ inches from edge. We furnish $\frac{1}{2}$ inch, 7-16 inch, and $\frac{3}{8}$ inch dies with punches to match, with machine, unless otherwise ordered.
Price \$50 00
Extra Punches, each 80
Extra Dies, each 1 20

SHEARS AND PUNCHES.

VICTOR No. 2.

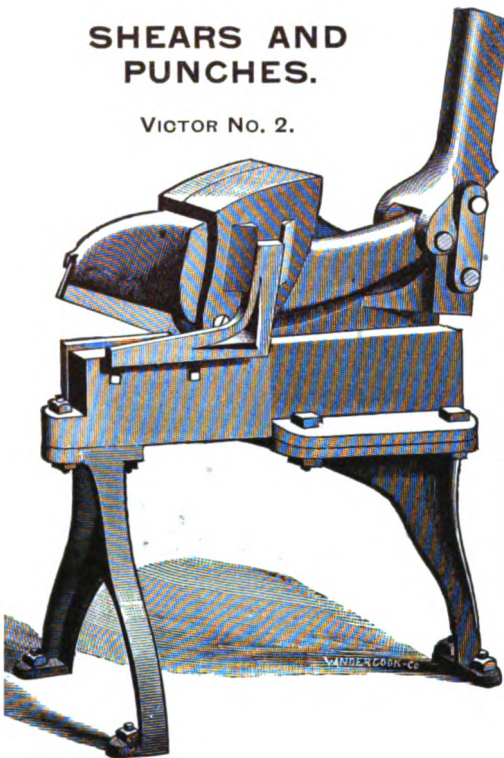


Plate 1251.

VICTOR No. 2.

This Shear is of the same design as No. 1, but is stronger and heavier. We consider this the best general purpose Shear for blacksmiths, that we make. It cuts 2 x $\frac{1}{2}$ inch bar, and $\frac{1}{4}$ inch steel plate any width, at any angle. It will cut off plow lays, and split a slab of steel from end to end if desired; thus bringing within its capacity almost any grade of cutting found in a jobbing shop. For boiler makers and those wishing a tool for cutting sheet metal, it is unsurpassed. We make this size with or without legs to suit purchaser.

With Legs	\$35 25
Without Legs	32 00
Lever, Extra	1 00

No. 6 VICTOR PUNCH.

This Punch is designed especially for the blacksmith trade. It weighs complete 450 lbs. Punches $\frac{1}{2}$ in. hole in $\frac{1}{2}$ in. iron or less to the center of an 8 in. circle. The lever works forward, thus bringing the operator in full view of the work. For durability and accurate work this Punch has no equal. We furnish one Punch and die with each machine. Extra punches and dies \$1.00 per pair. Steel lever with Punch.

Price \$60 00

No. 6.

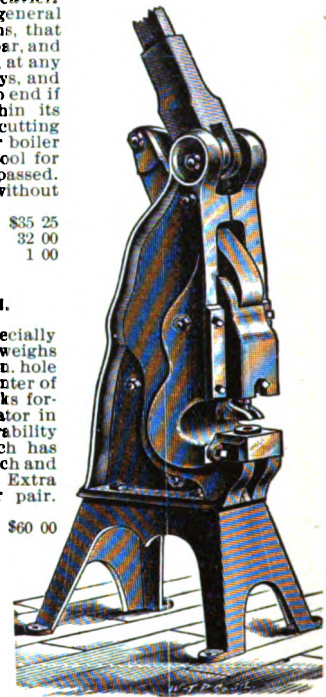


Plate 1252.

No. 3.

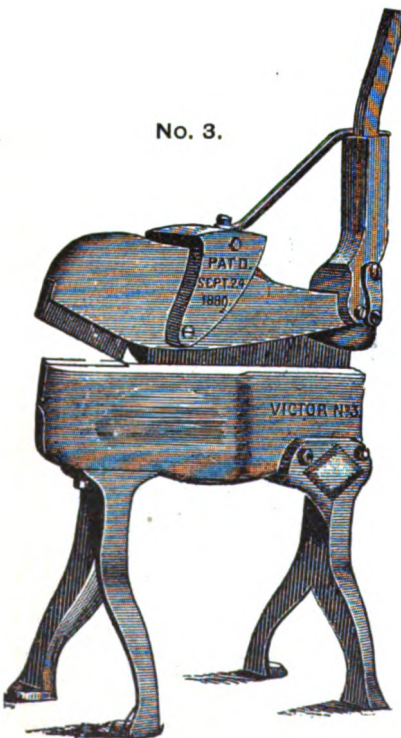


Plate 1253.

VICTOR No. 3.

This is the heaviest sized Shear we make; it is built with legs. Weighs, complete, 415 pounds, and is especially designed for heavy cutting. It is a continuous cutting Shear, thus making a tool for boiler makers and those who desire heavier tools than Nos. 1 and 2. It will cut 2 x $\frac{5}{8}$ bar and 5-16 steel plate.

Price \$50 00

No. 7 VICTOR PUNCH.

This machine will punch to the center of a 16 inch circle and is especially designed for boiler shops and sheet iron workers, it will punch $\frac{1}{2}$ in. hole in $\frac{1}{2}$ in. iron or less.

Weight	600 lbs.
Price	\$70 00

No. 7.

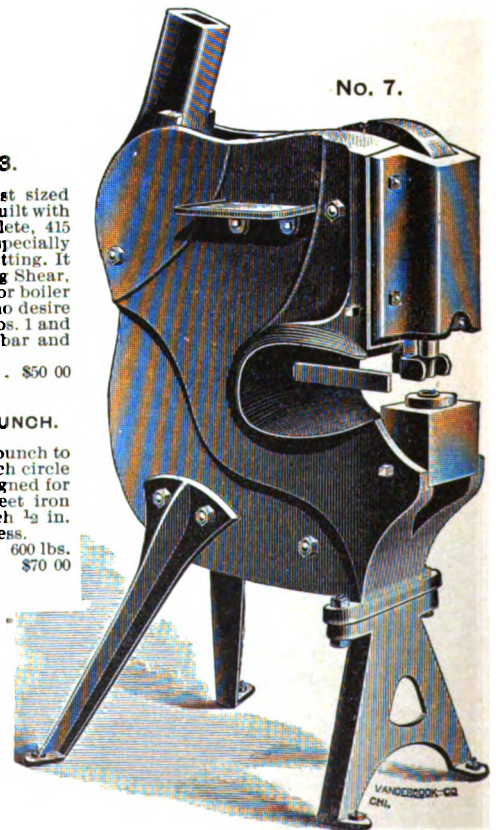


Plate 1254.

BUFFALO PUNCH. FURNISHED WITH LEGS.



Plate 1255.

- No. 12—Price with 3-32 in. and $\frac{1}{8}$ in. Punch and Die . . \$30 00
 No. 13—Price with $\frac{1}{4}$, 3-16, $\frac{1}{4}$ in. Punch and Die . . . 40 00
 No. 14—Price with $\frac{1}{4}$, 5-16, $\frac{3}{8}$ in. Punch and Die . . . 50 00
 No. 15—Price with $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in. Punch and Die 60 00
- Capacity No. 12 will punch $\frac{1}{8}$ in. hole in $\frac{1}{8}$ in. iron.
 Capacity No. 13 will punch $\frac{1}{4}$ in. hole in $\frac{1}{4}$ in. iron.
 Capacity No. 14 will punch $\frac{3}{8}$ in. hole in $\frac{3}{8}$ in. iron.
 Capacity No. 15 will punch $\frac{1}{2}$ in. hole in $\frac{1}{2}$ in. iron.

BUFFALO CONTINUOUS SHEAR.

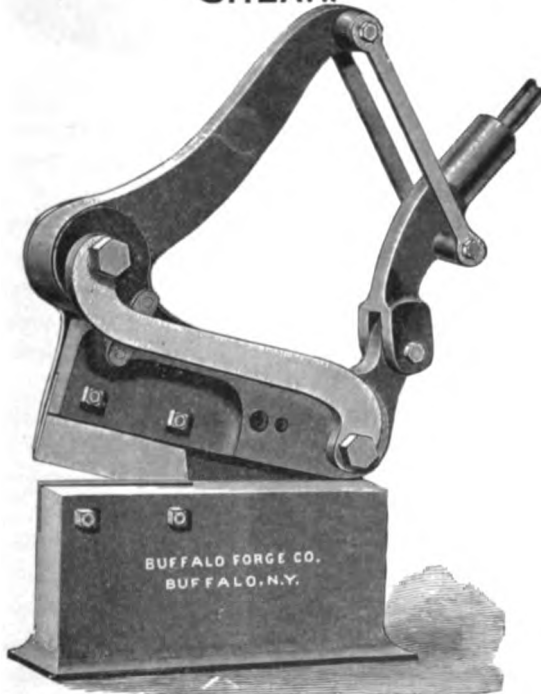


Plate 1257.

BUFFALO PUNCH, SHEAR AND BAR CUTTER. FURNISHED WITH LEGS.



Plate 1256.

CAPACITIES.

- No. 1 will shear $\frac{1}{4}$ in. strap iron $1\frac{1}{2}$ in. wide, will punch $\frac{1}{8}$ in. in $\frac{1}{8}$ in. iron, and cut off $\frac{3}{8}$ in.
 No. 2 will shear $\frac{1}{2}$ in. strap iron 2 in. wide, will punch $\frac{1}{4}$ in. in $\frac{1}{4}$ in. iron, and cut off $\frac{1}{2}$ in.
 No. 3 will shear $\frac{1}{2}$ in. strap iron 3 in. wide, will punch $\frac{3}{8}$ in. in $\frac{3}{8}$ in. iron, and cut off 1 in.
 No. 4 will shear $\frac{3}{8}$ in. strap iron 3 in. wide, will punch $\frac{1}{2}$ in. in $\frac{1}{2}$ in. iron, and cut off $1\frac{1}{4}$ in.

The only machine permitting the operator to work either Punch, Shear or Bar Cutter without a helper. The only machine not requiring adjusting in changing the work, being ready at all times for Punching, Bar Cutting or Shearing with no change.

In the important items of power, durability and compactness it has not a competitor the world over. It has given entire satisfaction in three years' constant use, under the most severe tests, before being placed on the market. They are furnished upon legs.

- No. 1—Price with 3-32 in. and $\frac{1}{8}$ in. Punch and Die . . \$40 00
 No. 2—Price with $\frac{1}{4}$, 3-16, $\frac{1}{4}$ in. Punch and Die . . . 50 00
 No. 3—Price with $\frac{1}{4}$, 5-16, $\frac{3}{8}$ in. Punch and Die . . . 70 00
 No. 4—Price with $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ in. Punch and Die . . . 100 00

BUFFALO CONTINUOUS SHEAR.

These machines are guaranteed to do the work specified in the table of capacities with perfect ease. Except for the larger sizes, three feet lines are used. All parts are made to an exact standard size so that when put together they form a thoroughly well-fitted machine. Each component piece is interchangeable, and so well proportioned, that with proper care the work claimed may be done with no danger of breakage. All working parts are made of the best material to templates, and repairs (if ever required) may be furnished, which will be accurately fitted and finished. As regularly furnished this tool is upon legs of convenient height.

- No. 6—Continuous Shear, $\frac{1}{4}$ in. Flat \$30 00
 No. 7—Continuous Shear, 3-16 in. Flat 40 00
 No. 8—Continuous Shear, $\frac{1}{4}$ in. Flat 50 00
 No. 9—Continuous Shear, $\frac{3}{8}$ in. Flat 100 00

DIAMOND STATE PUNCH.

PLAIN PUNCH.

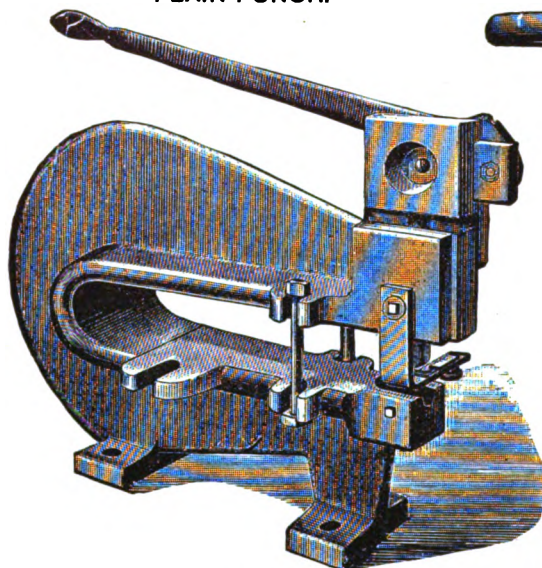


Plate 1258.

Plain Punch	\$20 00
Punch with Drilling Attachment only	28 00
Punch with Wire Cutter and Shear Attachments only	25 00
Punch with Drilling, Shearing and Wire-Cutting Attachments	33 00

PUNCH WITH DRILLING, SHEARING AND WIRE-CUTTING ATTACHMENTS.

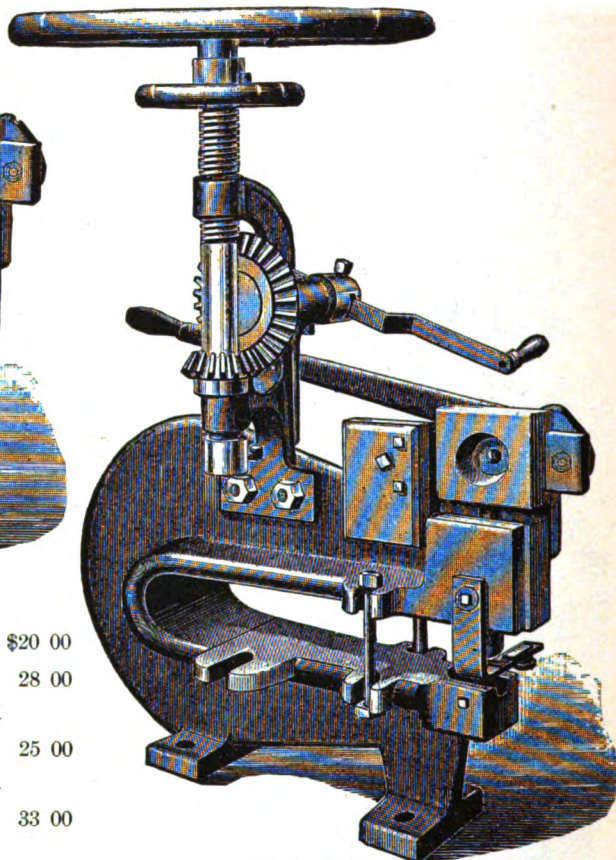


Plate 1259.

The machine illustrated above is more especially designed to punch light sheet metal to center of wide sheet. It will easily punch No. 12 iron or other softer metal, $\frac{1}{4}$ -inch hole to the center of a 30-inch sheet, or larger holes in thinner metal that distance from center.

By using the stay bolts, as illustrated, it will punch as large as $\frac{1}{4}$ -inch hole through $\frac{1}{4}$ -inch thickness of iron, or its equivalent in thinner metal, $3\frac{3}{4}$ inches from edge of sheet. The punch and die are instantly adjusted by first passing the punch up through the die seat and then in the punch socket, and then dropping the die into its seat; the alignment of the holes being so accurate that there is no possibility of careless or incompetent workmen getting them out of line, to endanger the breaking or mutilating the punch and die.

As shown in Plate 1259, the punch, where desired, has a drill attached, which is as efficient as many more costly hand drills. Also Shearing and Wire-Cutting Attachments. The Shear is for band iron $\frac{1}{8}$ thick and 2 inches wide, or by reversing, 4 inches wide. The Wire Cutter will cut iron wire $\frac{1}{4}$ inch diameter.

The Punch can be furnished singly (Plate 1258) or with any or all of the attachments (Plate 1259). The machine is very strong, having more metal well placed than any of its kind. It is well fitted, and the construction of its working parts such as to insure long service with the least possible chance of derangement or breakage. Each machine is furnished with 3 punches, and dies any size under $\frac{1}{2}$ inch. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ furnished if not otherwise ordered. Holes for oiling are properly located, and are put there for oil as often as needed. For Wire Cutting, drop the handle straight down, and pull up.

NEW STYLE POWER PUNCHING PRESSES.

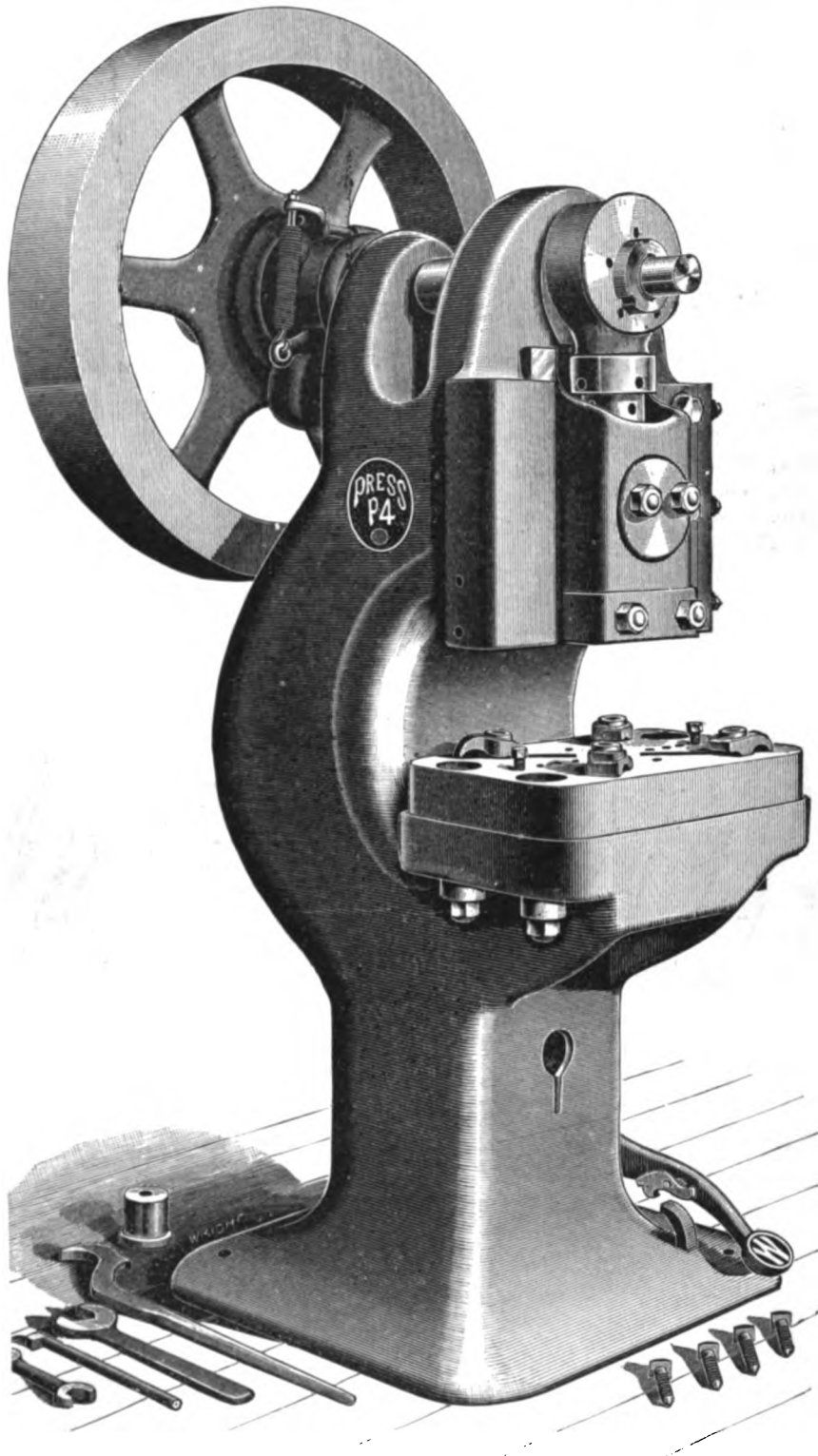
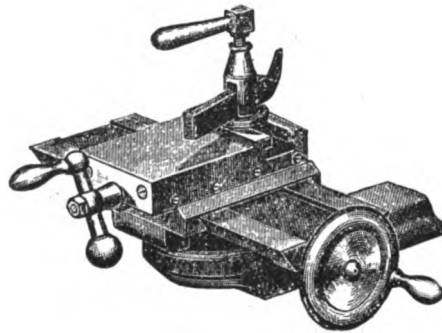


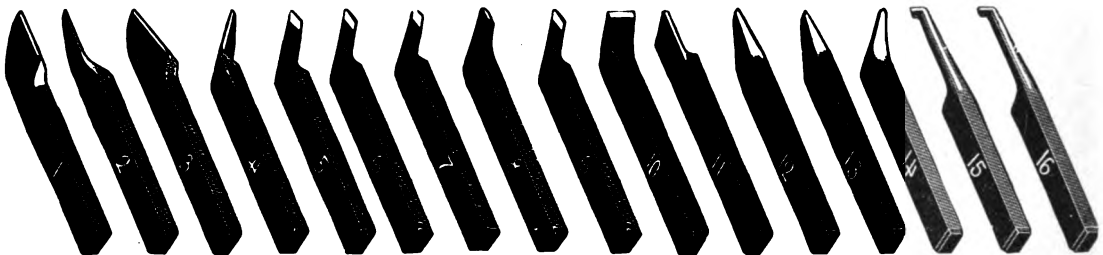
Plate 1260.

This style built in six sizes, and can be furnished either with or without Gearing.
Send for Special Catalogue of Presses.

SLIDE RESTS.**Plate 1261.**

Swing of Lathe, 6 inches	.....	\$10 00
Swing of Lathe, 8 inches	.....	12 00
Swing of Lathe, 10 inches	.....	30 00
Swing of Lathe, 12 inches	.....	35 00
Swing of Lathe, 14 inches	.....	52 00
Swing of Lathe, 16 inches	.....	55 00

NOTE.—The 6 inch and 8 inch Rests are for Amateur Lathes, and have no Swivel attachment.

LATHE TOOLS.**Plate 1262.**

1, Left Side Tool. 2, Right Side Tool. 3, Left Side Tool, bent. 4, Right Side Tool, bent. 5, Heavy Diamond Point for cast iron. 6, Diamond Point for steel and wrought iron, right hand. 7, Diamond Point for steel and wrought iron, left hand. 8, Half Diamond Point. 9, Round Nose. 10, Water Finishing Tool. 11, Cutting-Off Tool. 12, Roughing Tool. 13, Thread Tool. 14, Bent Thread Tool. 15, Inside Turning Tool. 16, Inside Thread Tool.

Size of Steel	$\frac{1}{8} \times \frac{3}{8}$	$\frac{1}{4} \times \frac{1}{2}$	$\frac{1}{2} \times \frac{5}{8}$	$\frac{3}{8} \times \frac{3}{4}$	$\frac{1}{4} \times 1$	$\frac{5}{8} \times 1\frac{1}{4}$	$\frac{3}{4} \times 1\frac{1}{2}$ in.
Single Tool	\$0 20	\$0 25	\$0 30	\$0 35	\$0 50	\$1 00	\$1 50
Set of Six	1 20	1 50	1 80	.....	.....	.....	.....
Set of Ten	2 00	2 50	3 00	3 50	5 00	10 00	15 00
Full Set . . . . .	.....	.....	4 80	5 60	8 00	16 00	24 00

For the convenience of those ordering our Turning Tools, we have numbered each tool, as we find the same tool is frequently called by a different name. These tools are carefully made from the best tool steel. We keep them in stock of the following sizes: $\frac{1}{8} \times \frac{3}{8}$ and $\frac{1}{4} \times \frac{1}{2}$ for slide rests, $\frac{1}{8} \times \frac{5}{8}$ for our 9 inch lathe, $\frac{3}{8} \times \frac{3}{4}$ for our 10 and 12 inch lathes, $\frac{1}{2} \times 1$ for heavy 12, 14 and 16 inch lathes, and $\frac{5}{8} \times 1\frac{1}{4}$ and $\frac{3}{4} \times 1\frac{1}{2}$ for larger lathes and planers. If wanted to use on a planer or shaper, so state in the order.

A set of six consists of one tool each—Nos. 1, 2, 11, 12, 13, 16.

A set of ten consists of one tool each—Nos. 1, 2, 4, 6, 7, 9, 11, 12, 13, 16.

SKINNER PATENT DRILL CHUCK.**FOR HOLDING STRAIGHT AND TAPER SHANK DRILLS.****Plate 1263.**

This Chuck is simple in construction; the Body is made of the best machinery steel, and the Jaws are hardened tool steel. It has been given the most severe tests to which a Chuck could be subjected, and always with entirely satisfactory results. We claim for this Chuck: Self centering, Self tightening, strongest grip, perfect accuracy, greatest durability.

FOR HOLDING STRAIGHT SHANK DRILLS.

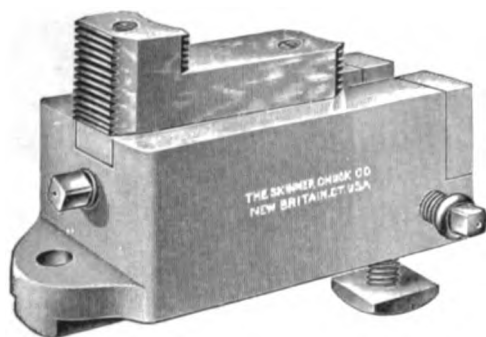
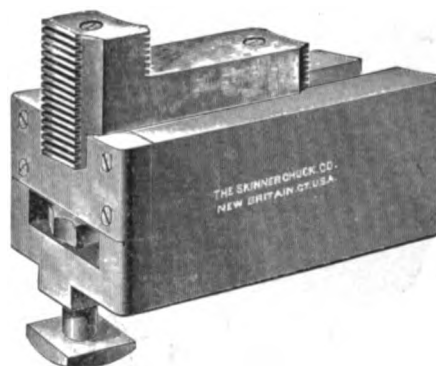
No. 0, Holding Capacity, 0 to $\frac{1}{8}$ inch (for jewelers)	\$ 6 00
No. 1, Holding Capacity, 0 to $\frac{1}{4}$ inch	7 00
No. 2, Holding Capacity, 0 to $\frac{3}{8}$ inch	8 50
No. 3, Holding Capacity, 0 to $\frac{1}{2}$ inch	10 00
No. 4, Holding Capacity, 0 to $\frac{3}{4}$ inch	15 00
No. 5, Holding Capacity, 0 to 1 inch	18 00

FOR HOLDING TAPER SHANK DRILLS.

No. 6, Holding Capacity, $\frac{1}{8}$ to $\frac{5}{8}$ inch	\$10 00
No. 7, Holding Capacity, $\frac{1}{4}$ to $\frac{7}{8}$ inch	15 00
No. 8, Holding Capacity, $\frac{1}{2}$ to 1 $\frac{1}{4}$ inch	18 00

SKINNER REVERSIBLE FACE PLATE JAW.

(PATENTED NOV. 17, 1891, AND NOV. 14, 1893.)

**Plate 1264.****Plate 1265.**

These Jaws are adapted to use on large lathe face plates, boring mill tables and drill presses, and on machines of too great capacity for the use of Chucks. The outer end of the Jaw is clamped to face plate by a common T head bolt, and the inner end by patent device. The nut on bottom of vertical bolt is adjustable, and when set properly a slight turn of the nut on the side of the Jaw near the inner end will clamp the Jaw securely in position. This nut is more accessible, and this arrangement for clamping the inner end of Jaw is preferable to using a common bolt. The rib on the bottom of the Jaw is $1\frac{1}{4}$ inches wide, and can be finished to exactly fit the slot in plate. The screws and movable Jaws are made of open hearth steel, the latter and the nut end of the screw being thoroughly case hardened. The necessary bolts and a steel wrench are furnished with each set of Jaws.

Size, 8 inch	Per Set of Three Jaws, \$45 00; Per Set of Four Jaws, \$ 60 00
Size, 10 inch	Per Set of Three Jaws, 60 00; Per Set of Four Jaws, 80 00
Size, 12 inch	Per Set of Three Jaws, 90 00; Per Set of Four Jaws, 120 00

DRILL CHUCKS.

WESTCOTT'S PATENT LITTLE GIANT.

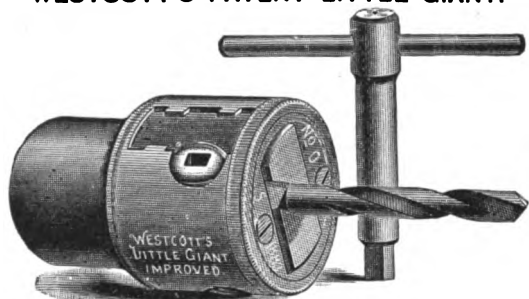


Plate 1266.

STRAIGHT BODY IMPROVED PATENT LITTLE GIANT.

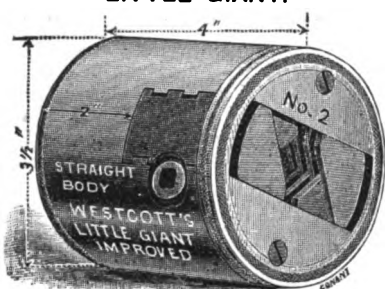


Plate 1268.

LITTLE GIANT IMPROVED—EXTRA STRONG SOREWS.

	Approximate Diameter	Holding Drills	Price
No. 00	1 1/4 inch	0 to 1/4 inch	\$ 7 00
No. 0	2 1/2 inch	0 to 1/2 inch	8 00
No. 1	3 inch	0 to 3/4 inch	9 00
No. 2	3 1/2 inch	0 to 1 inch	10 00
No. 2 1/2	4 inch	0 to 1 inch, extra strong	11 00
No. 3	6 inch	0 to 1 1/4 inch	18 00
No. 4	6 1/2 inch	0 to 2 inch	20 00
No. 5	7 inch	1 1/2 to 2 1/2 inch	25 00
No. 6	9 inch	3 inch capacity	.....

THE PRATT CHUCK.

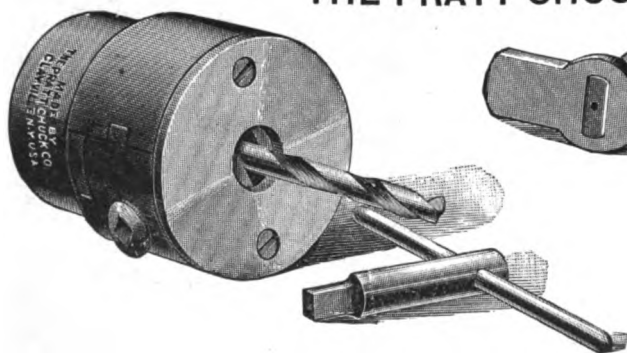


Plate 1269.

The above cut shows the Chuck assembled. The distinctive features of the Pratt Chuck is the patented equalizing driver in which the end of the drill is inserted, giving positive rotation to the drill independently of the jaws of the Chuck. This driver is self-adjusting, permitting the jaws to center and align the drill accurately in the Chuck, so that it is always true and absolutely impossible for the drill to slip while in work.

The parts of the Chuck are made to standard gauges and are practically interchangeable. The working parts are made from tool steel, carefully tempered to prevent wear, and with proper use are virtually indestructible. There is a decided saving in time in its use over the ordinary friction chuck, it being designed for continuous, rapid and hard service; it drives the drill to its full capacity without wear or damage to its shank.

THE ONEIDA PATENT.

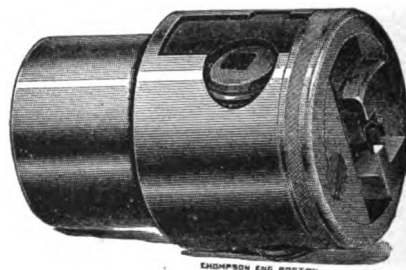


Plate 1267.

This Chuck was designed by Mr. Westcott with a view to increase the grip and to lessen the tendency to shear the drill, as is the case with some side-screw chucks now in use. In this Chuck the tongues are disposed obliquely across the axis of the drill, and in this way get a long bite on the drill, which will not groove if the drill should possibly slip. The body is made of spindle steel, and the jaws of the best tool steel, carefully hardened. Accuracy guaranteed.

This is the best Chuck ever brought out for blacksmiths' drill presses and woodworkers' boring machines.

THE ONEIDA PATENT.

	Approx. Diam.	Length	Weight	Capacity
No. 0	1 11-16 in.	2 1/8 in.	17 oz.	0 to 13-32 in.
No. 1	2 in.	3 in.	1 lb. 7 oz.	0 to 1/2 in.
No. 0	.....	.....	.....	\$7 00
No. 1	.....	.....	.....	8 00

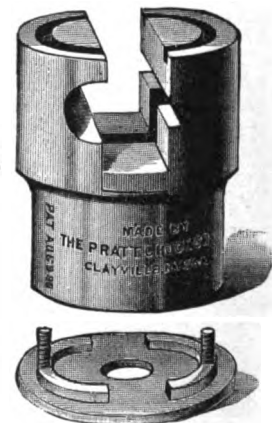
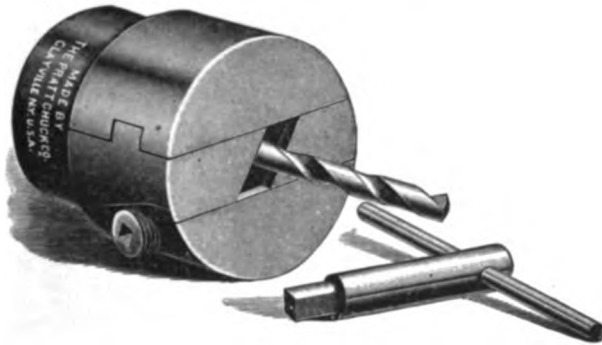


Plate 1270.

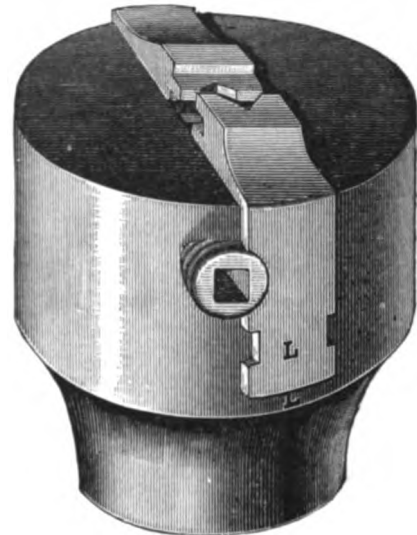
The above cuts show the Chuck Body and Face Plate, also the Positive Driver engaging the shank of drill.

PRATT'S PATENT IMPROVED POSITIVE DRIVING DRILL CHUCKS.

	Diameter	Holding Drills	Price Each
No. 1	2 1/4 in.	0 to 1/2 in.	\$ 8 00
No. 2	3 in.	0 to 3/4 in.	9 00
No. 3	3 3/4 in.	0 to 1 in.	10 00
No. 4	5 in.	0 to 1 1/2 in.	20 00
No. 5	6 3/4 in.	0 to 2 in.	25 00

DRILL CHUCKS.**THE EMPIRE FRICTION DRILL CHUCK.****Plate 1271.**

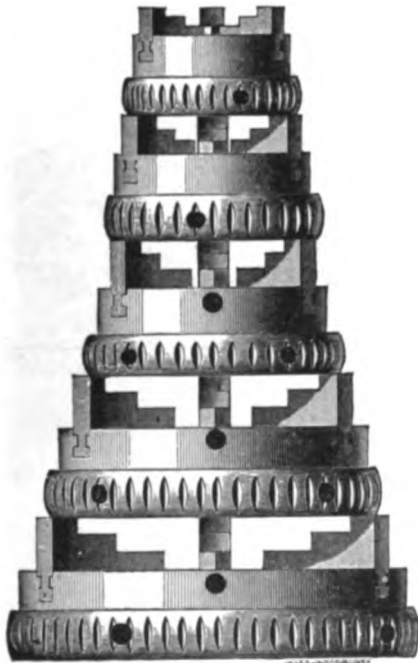
	Diameter	Capacity	Each
No. 6	1 1/4 inch	0 to 1/4 inch	\$5 00
No. 7	2 1/4 inch	0 to 1/2 inch	6 00
No. 8	3 inch	0 to 3/4 inch	7 00
No. 9	3 3/4 inch	0 to 1 inch	8 00
No. 10	5 1/4 inch	0 to 1 1/2 inch	17 00
No. 11	6 inch	0 to 2 inch	19 00

SKINNER STANDARD DRILL CHUCK.**Plate 1272.**

This Chuck will hold drills from 0 to 3/4 inch, according to sizes listed below; have hole entirely through them, and are made to fit a taper plug, or can easily be threaded to fit lathe spindle. They are made of the best materials, the jaws and screws being carefully tempered.

	Diameter	Capacity	Price
No. 000	1 3/4 inch	0 to 1/4 inch	\$6 00
No. 100	2 1/8 inch	0 to 1/2 inch	7 00
No. 101	2 7/8 inch	0 to 3/4 inch	8 00

This Chuck will not injure the drill.

CHAMPION CHUCKS.**Plate 1273.**

Diameter	1 Set Jaws	2 Set Jaws
2 inch	\$4 50	\$5 75
2 1/2 inch	5 00	6 25
3 inch	5 50	6 75
4 inch	6 50	8 00
5 inch	7 50	9 00

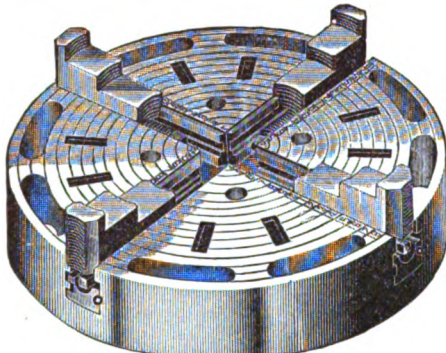
SKINNER NEW MODEL DRILL CHUCK.**Plate 1274.**

By revolving the knurled nut the jaws are moved outward or inward in the converging slots in the chuck body as may be desired. The chuck can be operated by hand, and when a very firm grip is desired it may be obtained by the use of a spanner wrench, one being furnished with each chuck. The chuck may be taken apart readily for cleaning and oiling. A hole the full capacity of the chuck may be drilled through the center without injury to the chuck.

	Capacity	Each
No. 11	0 to 1/2 inch	\$5 50
No. 12	0 to 3/4 inch	5 50
No. 13	0 to 1 inch	9 00

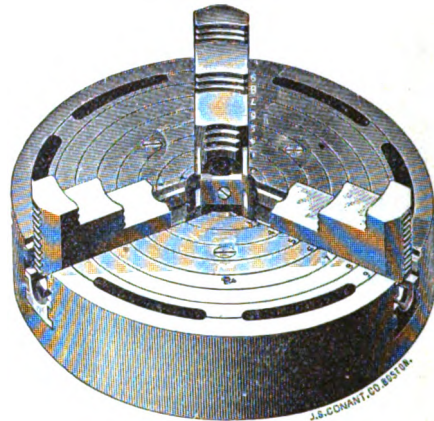
WESTCOTT PATENT LATHE CHUCKS.

TRADE
I. X. L. INDEPENDENT LATHE CHUCK.
MARK.

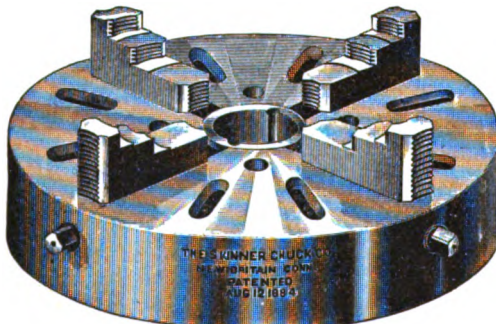
**Plate 1275.****JAWS REVERSIBLE.**

Diameter	Capacity	Weight	Diam. of Center Hole	Diam. of Recess for Face Plate	Price, with 3 or 4 Jaws
4 9-16 in.	5½ in.	.....	1 in.	3½ in.	\$ 14 00
6 in.	6¾ in.	.....	1¾ in.	5 9-16 in.	18 00
8 in.	9 in.	.....	1¾ in.	4 7-16 in.	22 00
10½ in.	12 in.	.....	2 in.	5½ in.	26 00
13¼ in.	17 in.	.....	3 in.	6½ in.	32 00
16 in.	20 in.	.....	3 in.	7½ in.	38 00
18½ in.	23 in.	.....	4 in.	8 in.	44 00
21¼ in.	26 in.	.....	4 in.	9½ in.	55 00
24 in.	30 in.	.....	4¾ in.	10 in.	65 00
30 in.	36 in.	.....	6 in.	12¾ in.	120 00
36 in.	43 in.	.....	7¼ in.	15 in.	210 00

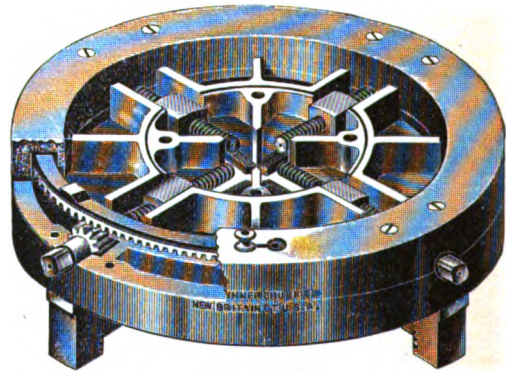
PATENT SCROLL COMBINATION
LATHE CHUCK.

**Plate 1276.**

Diameter over all.	Will hold Inside of Jaws	Diameter of Recess for Face Plate	Three Jaws, Price	Four Jaws, Price
4 9-16 in.	5½ in.	.....	\$ 24 00	\$ 30 00
6 in.	6¾ in.	.....	25 00	31 00
7½ in.	8 in.	3½ in.	26 00	32 00
10½ in.	12 in.	4 7-16 in.	34 00	42 00
13¼ in.	15 in.	5 9-16 in.	44 00	56 00
16 in.	18 in.	6¾ in.	52 00	64 00
18½ in.	21½ in.	7 9-16 in.	62 00	75 00
21¼ in.	26 in.	9½ in.	80 00	95 00
24 in.	30 in.	10 in.	100 00	120 00
30 in.	36 in.	12¾ in.	170 00	200 00
36 in.	43 in.	15 in.	230 00	285 00

THE SKINNER LATHE CHUCKS.**INDEPENDENT CHUCK.****Plate 1277.****JAWS REVERSIBLE.**

Order by these Numbers	Diameter of Chuck Body	Price	Diam. of Hole Through Center	Diam. of Recess for Face Plate
104	4 9-16 in.	\$ 14 00	¾ in.	2½ in.
106	6 7-16 in.	18 00	1¼ in.	4 in.
108	8 in.	22 00	1½ in.	4 in.
110	10 in.	26 00	1¾ in.	4¾ in.
112	12½ in.	30 00	2 in.	6 in.
114	14 in.	34 00	2½ in.	7 in.
116	16 in.	38 00	2¾ in.	7¾ in.
118	18 in.	44 00	3 in.	8 in.
120	20 in.	50 00	3 in.	10 in.
122	22 in.	57 00	3 in.	12 in.
124	24 in.	65 00	3 in.	12 in.
126	26 in.	80 00	3 in.	13 in.
128	28 in.	100 00	3 in.	14 in.
130	30 in.	120 00	3¾ in.	15 in.
136	36 in.	210 00	3¾ in.	18 in.
142	36 in.	240 00	3¾ in.	18 in.

COMBINATION CHUCK.**Plate 1278.**

Size Chuck	Price, 3 Jaws	Price, 4 Jaws	Diam. of Chuck Body	Cap. with Common Jaws	Diam. of Face Plate Seat	Diam. of Center Hole
3 in.	\$ 18 00	.....	3½ in.	3½ in.	1 15-16 in.	¾ in.
4 in.	22 00	\$ 26 00	4½ in.	4½ in.	2¾ in.	1 15-16 in.
5 in.	25 00	30 00	5½ in.	5½ in.	3½ in.	1¼ in.
6 in.	26 00	32 00	6½ in.	6½ in.	3½ in.	1¼ in.
8 in.	30 00	38 00	8½ in.	8½ in.	4½ in.	1½ in.
9 in.	34 00	42 00	9½ in.	10¼ in.	5 in.	1½ in.
12 in.	44 00	56 00	12½ in.	13 in.	6¾ in.	1½ in.
15 in.	52 00	64 00	15¼ in.	16¼ in.	7 in.	2 in.
18 in.	62 00	75 00	17 in.	19¼ in.	8 in.	2½ in.
21 in.	80 00	95 00	20 in.	22½ in.	8¾ in.	2½ in.
24 in.	100 00	120 00	21½ in.	25¾ in.	10 in.	2¾ in.
26 in.	130 00	160 00	26 in.	30 in.	13 in.	3 in.
30 in.	170 00	200 00	30¼ in.	33¼ in.	15 in.	3 in.
36 in.	230 00	285 00	35½ in.	38¾ in.	18 in.	3 in.
42 in.	270 00	325 00	.....	42½ in.	18 in.	3 in.

SKINNER COMBINATION AND UNIVERSAL LATHE CHUCKS.

REVERSIBLE JAW CHUCK.

STYLE J.

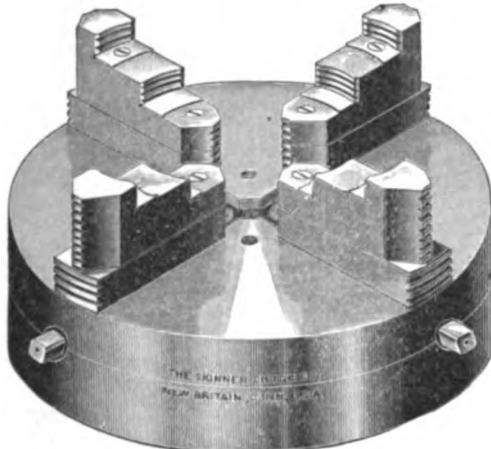


Plate 1279.

THE SKINNER UNIVERSAL CHUCK.

COMMON JAW, STYLE A.

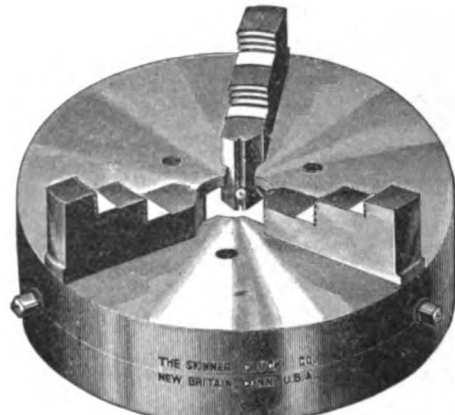


Plate 1280.

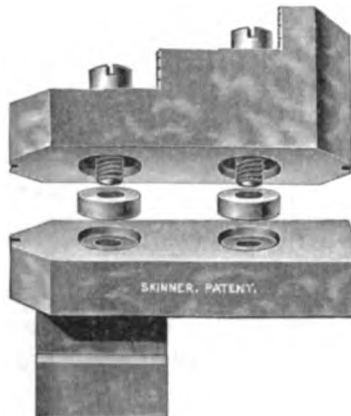


Plate 1281.

This Chuck is made of the very best materials, and in all sizes from 3 inch to 42 inch inclusive. The shell, which consists of two parts, is of the very best grade of cast iron, highly and accurately finished. The jaws are made of steel drop forgings, with solid nuts, thoroughly case hardened, and ground true. The gearing and screws are made of steel which is manufactured especially for this purpose.

We will furnish any kind of style jaws to order.

Size Chuck	Price, 3 Jaws	Price, 4 Jaws	Diameter of Chuck Body	Capacity with Common Jaws	Diameter of Face Plate Seat	*Diameter Cen. Hole
3 inch	\$ 18 00	.....	3 ⁵ / ₈ inch	3 ⁵ / ₈ inch	1 ¹ / ₈ inch	3/ ₄ inch
4 inch	22 00	\$ 26 00	4 ⁷ / ₈ inch	4 ⁷ / ₈ inch	2 ³ / ₄ inch	1 ¹ / ₈ inch
5 inch	25 00	30 00	6 ¹ / ₄ inch	5 ³ / ₄ inch	3 ¹ / ₂ inch	1 ¹ / ₄ inch
6 inch	26 00	32 00	7 inch	6 ³ / ₄ inch	3 ¹ / ₂ inch	1 ¹ / ₄ inch
8 inch	30 00	38 00	8 ³ / ₈ inch	8 ³ / ₈ inch	4 ¹ / ₂ inch	1 ¹ / ₂ inch
9 inch	34 00	42 00	9 ⁵ / ₈ inch	10 ¹ / ₄ inch	5 inch	1 ¹ / ₂ inch
12 inch	44 00	56 00	12 ¹ / ₂ inch	13 inch	6 ³ / ₈ inch	1 ⁵ / ₈ inch
15 inch	52 00	64 00	15 ¹ / ₄ inch	16 ¹ / ₄ inch	7 inch	2 inch
18 inch	62 00	75 00	17 inch	19 ¹ / ₄ inch	8 inch	2 ¹ / ₂ inch
21 inch	80 00	95 00	20 inch	22 ¹ / ₂ inch	8 ³ / ₄ inch	2 ¹ / ₂ inch
24 inch	100 00	120 00	21 ⁵ / ₈ inch	25 ³ / ₄ inch	10 inch	2 ³ / ₄ inch
26 inch	130 00	160 00	26 inch	30 inch	13 inch	3 inch
30 inch	170 00	200 00	30 ¹ / ₄ inch	33 ¹ / ₄ inch	15 inch	3 inch
36 inch	230 00	285 00	35 ⁵ / ₈ inch	38 ³ / ₄ inch	18 inch	3 inch
42 inch	270 00	325 00	.....	42 ¹ / ₂ inch	18 inch	3 inch

*We can make larger center hole in Chucks than sizes given in the table if desired.

SKINNER IMPROVED PLANER CHUCKS.

ADAPTED FOR USE ON PLANERS, SHAPERS, MILLING MACHINES AND UPRIGHT DRILLS.

ROUND SWIVEL BASE.

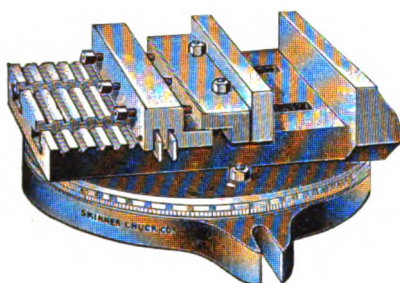


Plate 1282.

SQUARE BASE.

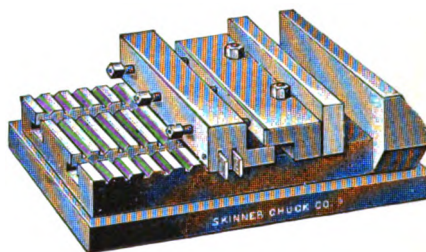


Plate 1283.

These Chucks are heavy and strong, are accurately made of the best materials, and have a greater capacity than any other. Set screws and holding strips are made of crucible steel, and the ends of set screws are hardened. All nuts are thoroughly case-hardened. A strip of tool steel is fitted to the movable jaw to take the thrust of the set screws. A drop forged steel wrench is furnished with each Chuck.

These Chucks will hold either straight or taper work, and can be instantly adjusted from 0 to greatest capacity, no blocking or packing being necessary. The movable jaw will not tip back or raise work from the bed.

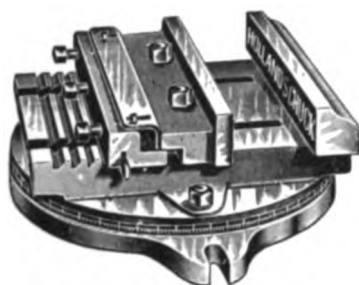
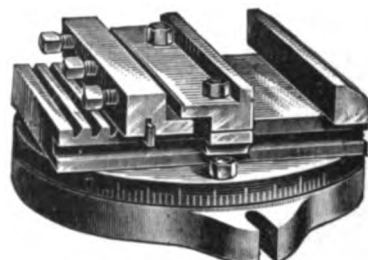
A rib $1\frac{1}{8}$ inches wide is cast on the bottom of all Round Base Chucks for fitting to slots in Planer Table. We can arrange the base of these Chucks to attach to a variety of styles and makes of machines as desired. All Round Base Chucks are accurately graduated.

ROUND SWIVEL BASE CHUCK.

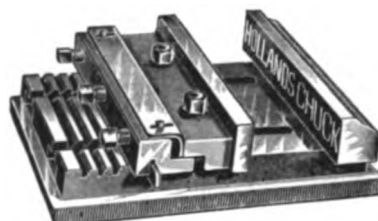
Size Chuck, No.	Price	Length of Jaw, Inches	Depth of Jaw, Inches	Jaws will Open, Inches	Space Required, Inches
6	\$ 25 00	7	$1\frac{1}{2}$	$3\frac{1}{2}$	10
8	30 00	9	$1\frac{7}{8}$	5	$12\frac{1}{2}$
10	36 00	11	$2\frac{3}{8}$	6	$14\frac{1}{2}$
12	40 00	13	$2\frac{3}{8}$	8	$16\frac{3}{4}$
15	50 00	$15\frac{1}{2}$	$2\frac{1}{2}$	$9\frac{1}{2}$	20
18	60 00	$18\frac{1}{2}$	$2\frac{3}{4}$	$11\frac{1}{4}$	23
24	90 00	$24\frac{1}{4}$	$2\frac{3}{4}$	16	27
30	120 00	$30\frac{1}{4}$	$2\frac{3}{4}$	$21\frac{1}{2}$	34

SQUARE BASE CHUCK.

Size Chuck, No.	Price	Space Required, Inches
6	\$ 20 00	$7\frac{1}{4} \times 11$
8	25 00	9 $\times 12\frac{1}{2}$
10	30 00	11 $\times 15$
12	35 00	13 $\times 17$
15	45 00	$15\frac{1}{2} \times 21$
18	55 00	$18\frac{1}{2} \times 24$
24	75 00	$24\frac{1}{4} \times 28$
30	100 00	$30\frac{1}{4} \times 34$

JORDAN'S IMPROVED PLANER CHUCKS.**ROUND BASE PLANER CHUCKS.****STYLE A.****Plate 1284.****STYLE B.****Plate 1285.**

Style B has no slots in bed, and the movable jaw is held down by steel jibbs at the ends of jaw, running in grooves in the side of bed, otherwise made same as Style A. In ordering, state which style is wanted. Eight inch trucks are made Style B.

SQUARE BASE PLANER CHUCKS.**STYLE A.****Plate 1286.**

The Movable Jaw has a strip of tool steel on its back edge for set screws to go against. Set screws and holding strip are tool steel. Wrench in drop forged steel. These Chucks will hold straight or taper work, and will move instantly from greatest to least capacity, and need no blocking or packing. The Movable Jaw will not tip back or raise work from the bed. Every Chuck is warranted. A rib or strip is cast on the bottom of Round Base Chuck, $1\frac{1}{8}$ inches wide, to be fitted to slot in planer table.

Length of Jaws	Price, Round Base Chuck	Price, Square Base Chuck	Space Required Between Planer Posts	Distance Jaws will Open	Weight of Round Base	Weight of Square Base
8 inch	\$30 00	\$25 00	14 inch	5 inch	95 lbs.	75 lbs.
10 inch	38 00	30 00	15 $\frac{1}{2}$ inch	6 inch	130 lbs.	100 lbs.
12 inch	40 00	35 00	17 $\frac{1}{2}$ inch	7 inch	160 lbs.	140 lbs.
15 inch	50 00	45 00	21 inch	9 $\frac{1}{2}$ inch	250 lbs.	150 lbs.
18 inch	60 00	55 00	24 inch	11 inch	280 lbs.	195 lbs.
24 inch	90 00	75 00	29 inch	16 inch	480 lbs.	300 lbs.
30 inch	120 00	100 00	34 inch	21 inch	575 lbs.	400 lbs.

GEAR CUTTING ATTACHMENT.

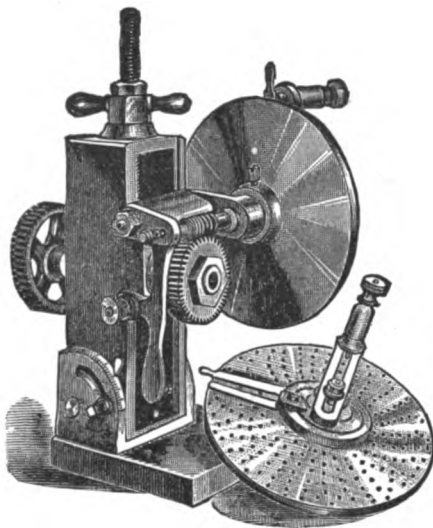


Plate 1287.

This attachment is designed to be used on any screw cutting lathe. For amateurs, clock makers, tool makers, or any one having use for small spur, bevel, or mitre gears, in quantities that will not warrant the purchase of a large gear cutting machine, this attachment is indispensable and will often pay for itself on a single job. The blank to be cut is held on a mandrel fitting a taper socket in the spindle of the sliding head, and is revolved by a steel worm working in a cast iron gear connected with the dials. The cutters are held on a mandrel between the centers of the lathe, the cross feed screw of the lathe being used to feed the work over the cutters. The spindle has a vertical adjustment of 4 inches and the diameter of the gear which can be cut depends upon the swing of the lathe. It can be used for a great variety of work, such as fluting taps and reamers, making milling cutters, or any work that can be done on an index milling machine.

Two dial plates giving 133 changes and dividing all numbers to 50, and all even numbers to 100, together with a great variety of other divisions, are furnished with each machine.

Price \$35 00

CHEAP LATHE HEADS.

These heads are offered to the trade to meet the demand for a machine of low price. They are well made and the bottoms are planed to bring the centers in line. The No. 1 and No. 2 have hollow steel head spindles running in cast iron bearings. The Nos. 3 and 4 have Babbitt bearings, and the centers are the No. 2 Morse Taper. The cones are carefully balanced, being turned on the inside, and no better made lathes have ever been placed on the market. Each set of heads consists of 1 Head Stock, 1 Rest Socket, 1 Face Plate, 1 Common Center, 3 Bolts, 1 Tail Stock, 2 T Rests, 1 Spur Center, 2 Hand Wheel Nuts, 3 Flanges.

Any additional parts wanted will be an extra charge.

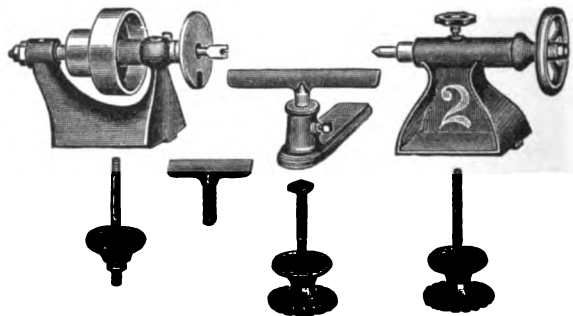


Plate 1288.

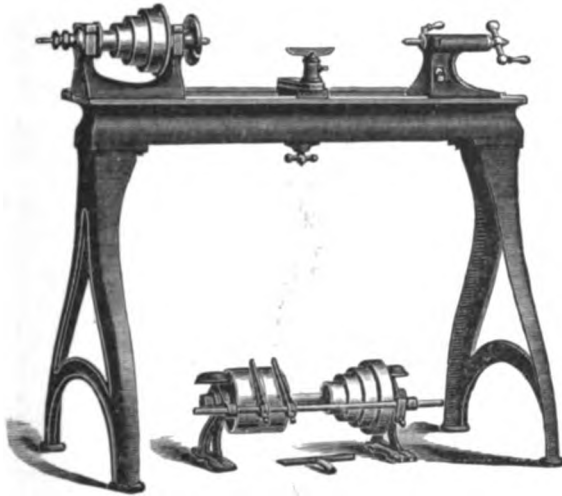
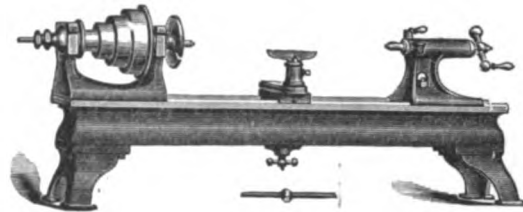
No. 1, Swing, 6 inch; number Speeds on Cone, 2; width of Belt, 1 inch	\$11 00
No. 2, Swing, 8 inch; number Speeds on Cone, 2; width of Belt, 1¼ inch	17 00
No. 3, Swing, 11 inch; number Speeds on Cone, 3; width of Belt, 1½ inch	22 00
No. 4, Swing, 13 inch; number Speeds on Cone, 4; width of Belt, 1½ inch	33 00

Turned Balance Wheels, Shaft Boxes and Cranks for operating Lathe by Foot Power:

No. 1, diameter, 20 inch; weight, 30 lbs.	\$ 8 00
No. 2, diameter, 22 inch; weight, 40 lbs.	10 00
No. 3, diameter, 22 inch; weight, 60 lbs.	13 00

Countershaft:

No. 1, size of Tight and Loose Pulleys, 3 x 1 inch	\$ 8 00
No. 2, size of Tight and Loose Pulleys, 4 x 1½ inch	9 00
No. 3, size of Tight and Loose Pulleys, 5 x 2 inch	11 00
No. 4, size of Tight and Loose Pulleys, 6 x 3 inch	13 00

YOUNG'S HAND LATHES.**Plate 1289.****YOUNG'S BENCH LATHES.****Plate 1290.****YOUNG'S HAND LATHES.**

These Lathes are capable of running at a high rate of speed. Have hollow spindles. The bearings are well proportioned and are carefully scraped to a fit. The cones turned inside to balance, and each Lathe is tested at a speed of 3000 revolutions per minute before leaving the shop.

Length of Bed, Feet	Swing Over Bed, Inches	Distance between Centers, Inches	Price, either Foot Power or Counter-shaft	Price, both Foot Power and Counter-shaft	Back Gears, Extra
4 . . .	10 . . .	28 . . .	\$ 65 00	\$ 75 00
4 . . .	12 . . .	28 . . .	80 00	95 00	\$ 15 00
5 . . .	12 . . .	40 . . .	83 00	98 00	
6 . . .	12 . . .	52 . . .	86 00	101 00	
4 . . .	14 . . .	22 . . .	115 00	25 00
5 . . .	14 . . .	34 . . .	118 00	.....
6 . . .	14 . . .	46 . . .	121 00	.....
7 . . .	14 . . .	58 . . .	124 00	.....
8 . . .	14 . . .	70 . . .	127 00	35 00
5 . . .	16 . . .	34 . . .	130 00	.....
6 . . .	16 . . .	46 . . .	134 00	.....
7 . . .	16 . . .	58 . . .	138 00	.....
8 . . .	16 . . .	70 . . .	142 00	

YOUNG'S BENCH LATHES.

These Lathes are designed to meet the demand for a strong, light-running Hand Lathe, capable of running at a high rate of speed. Have hollow spindle. The centers of the 10-inch are the same as the Morse Socket No. 1. The 12-inch being the same as the No. 2. The bearings are well proportioned and are carefully scraped to a fit. The cone is turned inside to balance it, and each Lathe is tested at a speed of 3000 revolutions per minute before leaving the shop.

Swing Over Bed	Length of Bed	Distance between Centers	Price, Complete
6 inches	24 inches	14 inches	\$13 00
8 inches	30 inches	18 inches	18 00
8 inches	48 inches	36 inches	25 00
9 inches	42 inches	24 inches	46 00
10 inches	42 inches	24 inches	65 00
12 inches	48 inches	28 inches	80 00
12 inches	60 inches	40 inches	83 00
12 inches	72 inches	52 inches	86 00

Back Gears, for 12-inch Lathe, extra . . . \$15 00 Lever Feed for Tail Spindle, extra . . . \$5 00

NOTE.—Back Geared Lathes have a Three-section Cone.

YOUNG'S 9 INCH SCREW CUTTING LATHE.

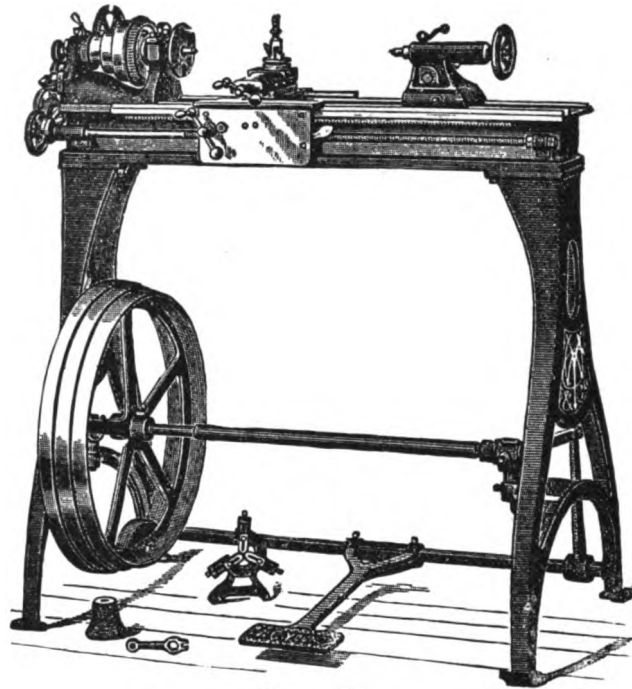


Plate 1291.

In presenting this Lathe to the trade, it has been our aim to furnish at a reasonable price, a machine combining neatness of design and finish, with such features as will enable a workman to do a great variety of work without going to the expense of purchasing a long list of extras, which frequently amount to nearly as much as the cost of the Lathe.

We provide each Lathe with hollow spindle compound rest, center rest, reversing motion for cutting right or left hand threads, hand rest attachment with long and short T's, belt, a full set of change gears, face plate, centers, wrenches, etc.

The head spindle has a $\frac{3}{8}$ inch hole its entire length, and the centers correspond to the Morse Taper Socket No. 1.

The cone has three changes for a $1\frac{1}{2}$ inch belt and with the back gears gives six changes of speed.

The compound rest can be adjusted to any angle, and also be moved to and from the centers, across the bed of the Lathe. The tool is raised and lowered by means of a screw.

The feed, both for turning and screw cutting, is operated by an open and shut nut and lever in the apron. Gears for cutting screws, from 6 to 48, are furnished. The spindles, lead screw studs, and all the smaller gears are made of the best machinery steel.

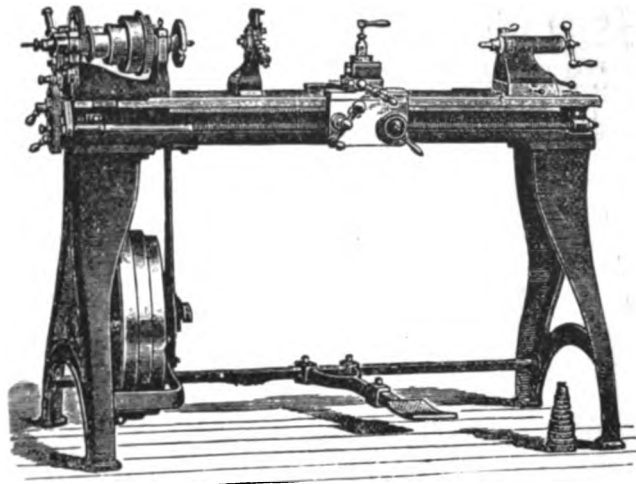
Swing	Between Centers	Length of Bed	Net Weight	With Foot Power	With Countershaft	On Short Legs
9 inch	24 inch	41 inch	300	\$75 00	\$75 00	\$75 00
9 inch	36 inch	53 inch	320	85 00	85 00	85 00

Extra attachments, if wanted:

Countershaft, when wanted with Foot Power	\$10 00
8 inch Face Plate, 4 Slots	3 00
Set of 4 Chuck Jaws, with set Screws for same	2 00
Face Plate for Drill Chucks	1 50
Screw Chuck, 3 inch	2 00
Spur and Female Centers, each	1 50
Crotch Center	1 25
Step Center	1 25
Square Center	1 50
Blank Center, for holding Chucks	1 00
Plain Drill Chuck, with set Screw	1 75

YOUNG'S SCREW CUTTING LATHE.

10 AND 12 INCH.

**Plate 1292.**

These Lathes are designed to meet the demand for a light, strong Lathe, for either power or foot power. The spindles, screws, studs and feed gears are of steel, and the rack and all gears are cut. The head spindle has a $\frac{1}{2}$ inch hole through it. The cone has three changes for $1\frac{1}{2}$ inch belt, and with the back gears gives ample power for heavy work. The carriage is gibbed to the outside of the bed both on the front and back side its whole length, giving great stiffness to the tool. Has screw feed, operated by an open and shut nut in the apron, and is changed from right to left feed by a reversing lever in the head. Change gears to cut 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28 and 32 threads to the inch, go with the Lathe.

Length of Bed	Dist. Between Centers	Swing Over Ways	Swing Over Carriage	Price, with either Foot Power or Countershaft	Price, with both Foot Power and Countershaft
$3\frac{1}{2}$ feet	24 inch	10 inch	$6\frac{1}{2}$ inch	\$130 00	\$140 00
$4\frac{1}{2}$ feet	36 inch	10 inch	$6\frac{1}{2}$ inch	140 00	150 00
5 feet	40 inch	10 inch	$6\frac{1}{2}$ inch	150 00	160 00
4 feet	28 inch	12 inch	$9\frac{1}{2}$ inch	170 00	180 00
5 feet	40 inch	12 inch	$9\frac{1}{2}$ inch	180 00	190 00
6 feet	52 inch	12 inch	$9\frac{1}{2}$ inch	180 00	200 00

Extra Attachments, if wanted:

Belt for Foot Power Lathe	\$ 1 00
Compound Rest	20 00
Center Rest	4 50
Follow Rest	3 50
Eight-inch Face Plate, 4 Slots	3 00
Set of 4 Chuck Jaws	2 00
Face Plate for Drill Chucks	1 50
Screw Chuck, 3 inch	2 00
Hand Rest, for Wood Turning	2 00
Spur and Female Centers, each	1 50
Crotch Center	1 25
Step Center	1 25
Square Center	1 50
Blank Center, for holding Chucks	1 00
Plain Drill Chuck, with Set Screw	1 75

9 INCH SWING NEW MODEL STAR LATHE.

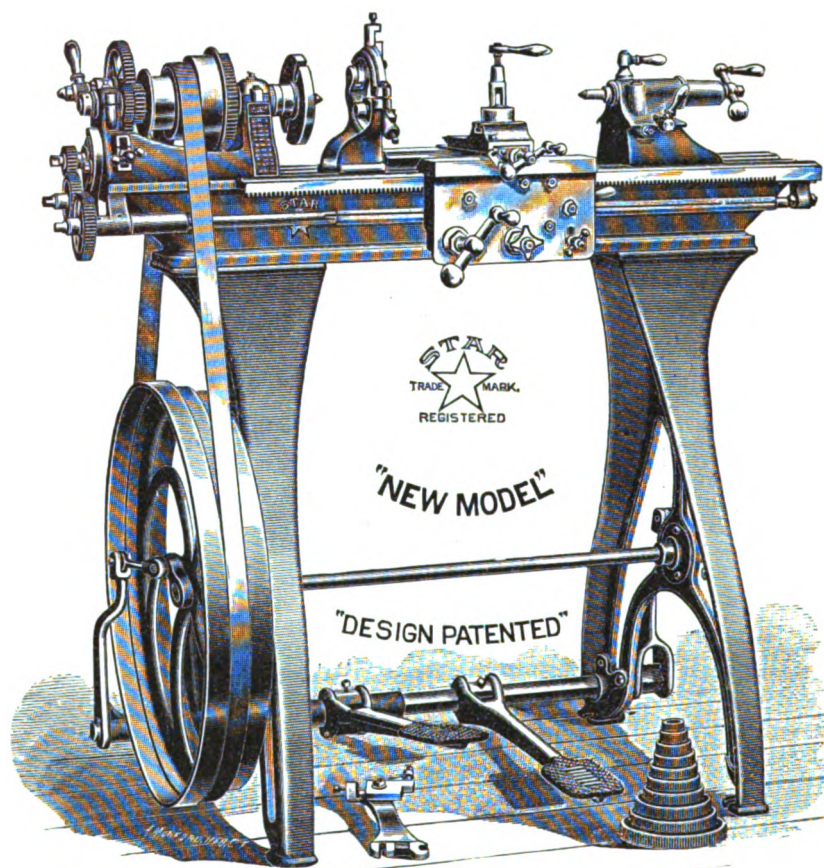


Plate 1293.

This is our new and latest improved Screw Cutting Engine Lathe with Automatic Cross Feed, etc., combining throughout the best materials with the highest class of workmanship and all of the valuable features looked for in a strictly first class Engine Lathe, and is equally well adapted for either Foot or Steam Power. It has a broad, heavy solid bed (with four V ways), and all other parts being proportionately heavy will take work to its full capacity without trembling or jarring; this, in connection with many other superior features should be borne in mind when selecting a Lathe. We invite comparison with any other Lathe of corresponding size on the market. Both Automatic Cross and Longitudinal Feeds, which may be thrown in or out of contact by simply turning a hand nut in the Apron, and will feed in or out, right or left, cut screws right or left, or may be thrown out of gear entirely by moving a lever in the Head Stock, without changing the motion of the foot or driving power. The Cross Feed will be found valuable in a large variety of work as it secures perfect accuracy in turning or facing up work, and with the addition of simple fixtures, which can be made by any ordinary workman, light milling may be done.

Steel Lead Screw, 12 Pitch U. S. Standard Thread, is splined, and for all work except screw cutting it simply acts as a Feed Rod; and therefore the only wear on its threads is in screw cutting. It is provided with an Open and Shut Nut, which is thrown in or out of contact by means of a Cam Lever in the Apron. It will cut all Standard threads, from 3 to 64, inclusive, without compounding the gears, and nearly all threads by compounding them.

No. of Size	Swing over Bed, Inches	Swing over Rest, Inches	Distance between Centers, Inches	Length of Bed, Inches	Hole through Spindle, Inches	Width of Cone Belt, Inches	Weight Complete, Pounds	Price, Either Foot Power or Counter-shaft	Price, Both Foot Power and Countershaft
10	9	5 $\frac{1}{8}$	24	44	$\frac{1}{2}$	1 $\frac{1}{4}$	370	\$100 00	\$110 00
20	9	5 $\frac{1}{8}$	36	56	$\frac{3}{4}$	1 $\frac{1}{4}$	400	110 00	120 00

Arranged with special Lead Screw and Gears (in place of regular) for cutting Metric Threads.

Blocking to raise Head and Tail Stocks and Tool Post to make swing 13 inches, extra	\$10 00
Compound Rest, if wanted, extra	15 00
Hand Rest, for wood turning, extra	2 50

Each Lathe is provided with a Center Rest, Follower Rest, 2 Point Centers, a full set of Change Gears, Wrenches, and everything complete as shown in cut.

11 INCH SWING NEW MODEL STAR LATHE.

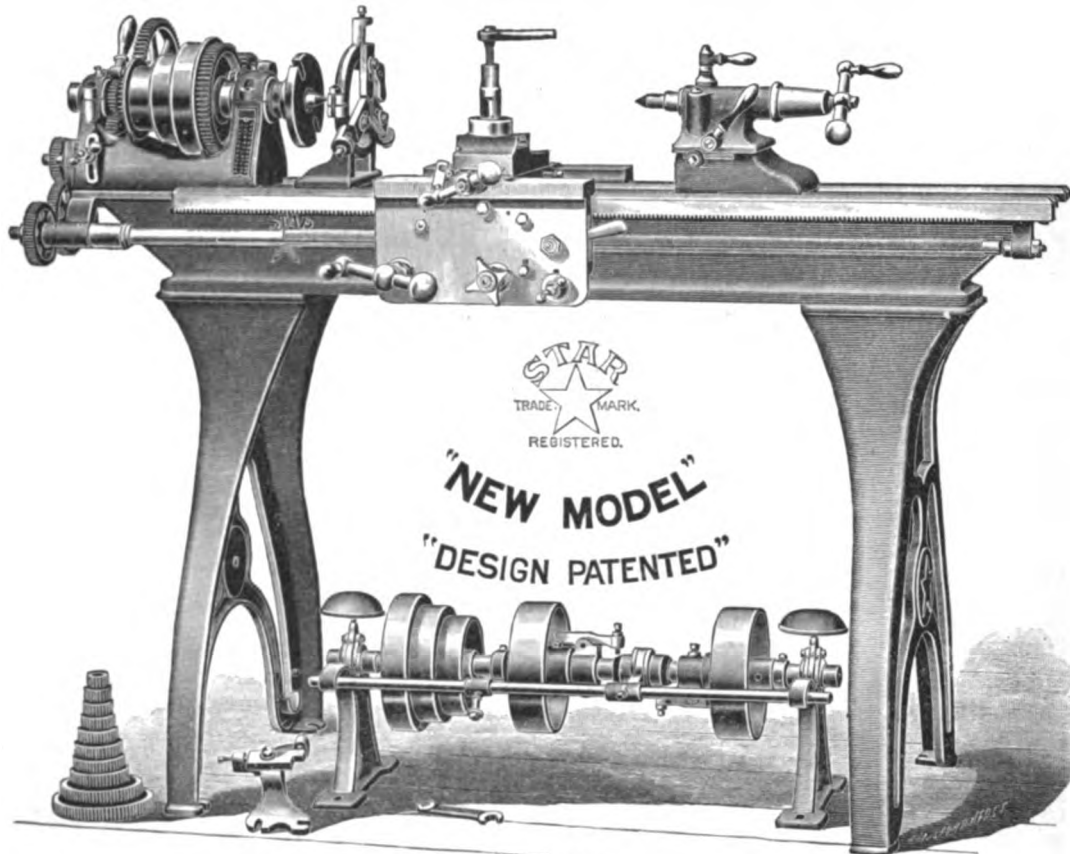


Plate 1294.

This is our New and Latest Improved Screw Cutting Engine Lathe with Automatic Cross-Feed, etc., combining throughout the best materials with the highest class of workmanship. It has a broad, heavy, solid bed, and all other parts being proportionately heavy will take work to its full capacity without trembling or jarring. This Lathe is as large as is practical to operate regularly by Foot Power, but when greater capacity is desired for any special work, the Blocking may be successfully used; the Blocking can be easily put on or taken off, and therefore the Lathe can be used in its normal shape for all ordinary work.

SPECIFICATIONS.

HEAD.—Spindle is made from a Crucible Steel Forging $1\frac{1}{4}$ inch diameter, and has 21-32 inch hole through it. Bearings are Phosphor Bronze. Centers are Standard Taper, $\frac{1}{2}$ inch to the foot. Cone Pulley has three (3) sections, 4 inch, $5\frac{1}{2}$ inch and 7 inch diameter, respectively, for $1\frac{1}{2}$ inch Belt. Ratio of Back Gearing 8 to 1; with Cone Pulley and Back Gears, gives six changes of speed. Swing over Bed, 11 inch; over Rest, $6\frac{3}{8}$ inch.

TAIL.—Spindle of Steel $1\frac{1}{4}$ inch diameter, arranged with Self-Discharging Center, also an Improved Spindle Locking Device which insures perfect alignment. Tail Stock is provided with an adjustable Side Movement for Turning Tapers, has a bearing of $7\frac{1}{2}$ inch on the Bed, and is rigidly held in position by a Cam Locking arrangement.

REST.—Pin Gib Rest, the strongest, most rigid and practical for general use on a Lathe of this size. Compound Rest is furnished as an Extra Attachment. Tool Post is provided with an Improved Collar and Shoe for Raising and Lowering the Tool. Carriage is strongly gibbed to the Bed both front and rear, and has a Clamping Device for locking it to the Bed when using the Cross-Feed.

FEED.—Our Improved Automatic Friction Cross and Longitudinal Feeds are actuated by a Phosphor Bronze Worm on the Lead Screw, which is splined, and for all work except screw cutting it simply acts as a Feed Rod, and therefore the only wear on its threads is in screw cutting. The Feed may be thrown in or out of contact by simply turning a Hand Nut in the Apron, and will feed in or out, right or left, cut screws right or left, or may be thrown out of gear entirely by moving a lever in the Head Stock, without changing the motion of the foot or driving power. The Cross-Feed will be found valuable in a large variety of work, as it secures perfect accuracy in turning or facing up work, and with the addition of simple fixtures, which can be made by any ordinary workman, light milling may be done. The Lead Screw is Steel, 9 Pitch U. S. Standard Thread, and is provided with an Open and Shut Nut, which is thrown in or out of contact by means of a Cam Lever in the Apron. It will cut all standard threads, from 3 to 64 inclusive, without compounding the gears, and nearly all threads by compounding them. If desired, can be furnished with Special Lead Screw (and Gears) for cutting Metric Threads, at same price.

FOOT POWER.—Our Patent Foot Power, by which the operator can obtain more leverage and produce greater power with less fatigue than with any other kind in use. It consists of Double Treadles, with a walking motion; the Treadles are movable and work independent of each other, each being connected at opposite ends of the Driving Wheel Shaft in such a manner as to produce a strong, positive and continuous power. It can be started or stopped instantly, and may be operated with both feet sitting, or with one foot standing, as desired.

IN GENERAL.—The Rack, Small Gears and all Working Screws are made from Steel; the Rack and all Gears being cut by automatic machinery, run smoothly. All small parts liable to be bruised are case-hardened. Each Lathe is provided with a Centre Rest, Follower Rest, 2 Point Centres, a full set of Change Gears, Wrenches, and everything complete as shown in cut.

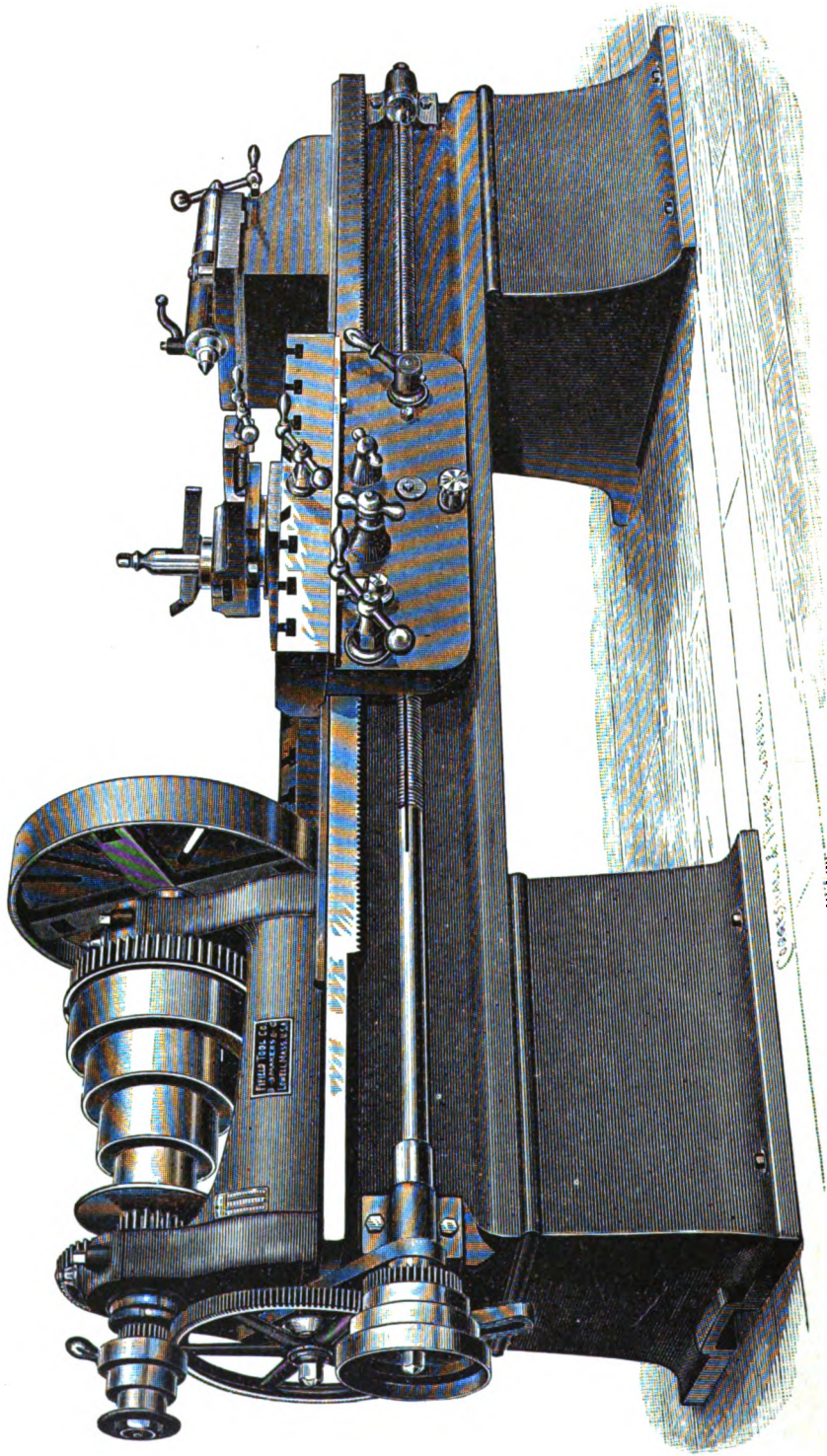
This Lathe contains several Patented Features (fully covered by six patents) which will not be found on any other make on the market.

	Swing Over Bed.	Distance Between Centres.	Length of Bed.	Weight.	Price with Foot Power.	Price with Countershaft.	Price on Short Legs with C. S.
No. 30	11 inch	36 inch	61 inch	600 lbs.	\$150 00	\$150 00	\$150 00
No. 40	11 inch	48 inch	73 inch	640 lbs.	160 00	160 00	160 00
No. 50	11 inch	60 inch	85 inch	680 lbs.	170 00	170 00	170 00

Blocking to raise Head and Tail Stocks and Tool Post to make swing 15 inches 15 00

This Blocking should be fitted to the Lathe before it leaves our Factory.

Unless otherwise specified, we will send Lathes with Foot Power, as shown in cut.

FIFIELD ENGINE LATHES.**NEW 26 INCH ENGINE LATHE.****Plate 1295.****(For Description See Next Page.)**

FIFIELD'S ENGINE LATHES.

These Lathes are of new design and built from entirely new patterns. They are convenient and quick to adjust, and combine the latest and most desirable improvements. The bearings are large and long, the cones have broad faces, and the heads are very strongly back-geared, with spindles of forged cast steel and of large diameters.

Each Lathe is furnished with inside power cross-feed, and the sizes from 22 inch above are furnished with compound rest arranged to move in any horizontal direction.

The carriages are very strongly gibbed and fitted with open and shut nut which enables the screw and the carriage to be connected at any point. The feed is unusually strong and durable and can be changed for right or left instantly.

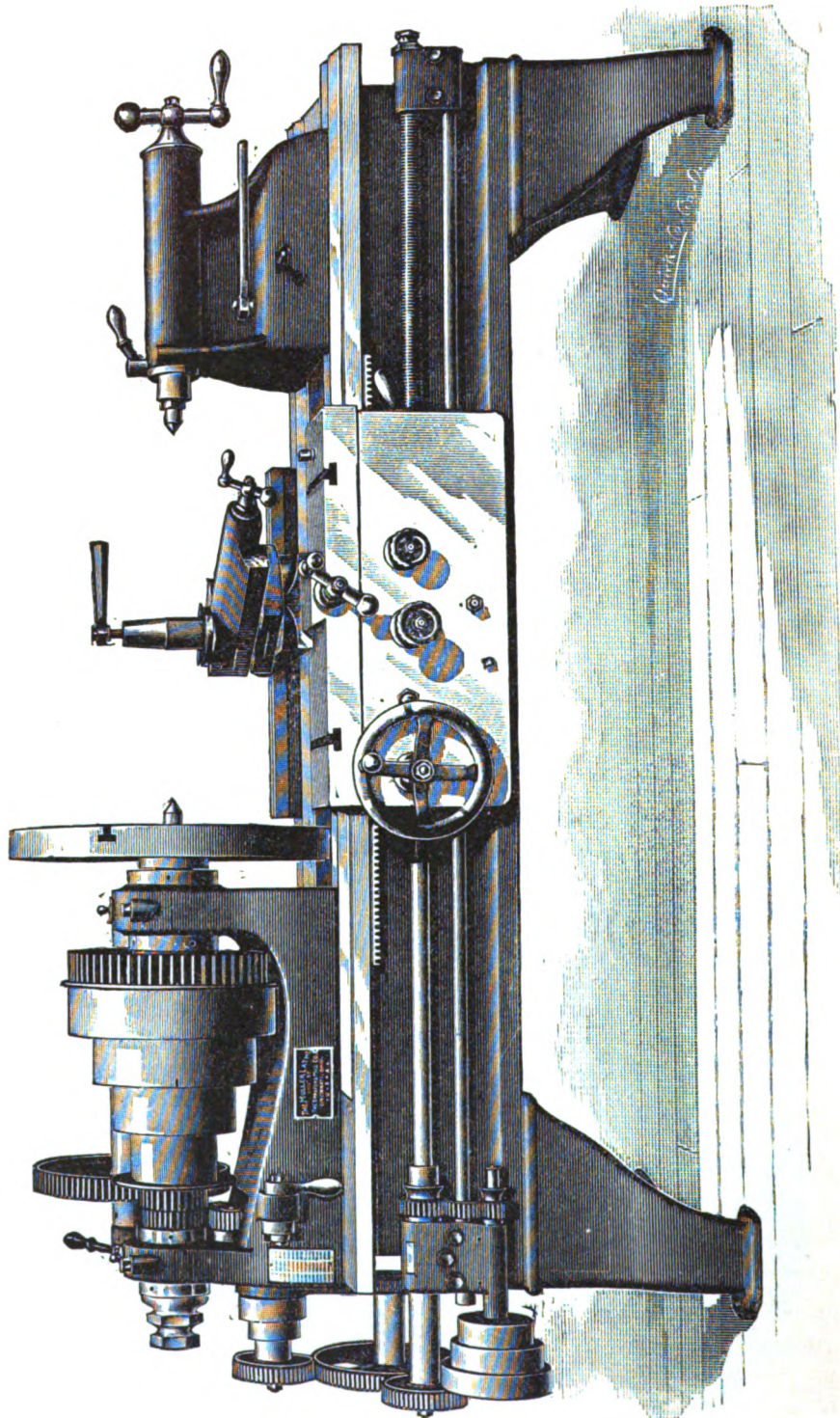
The rack and pinion are steel, cut from the solid, and all sliding parts are scraped, not emery finished.

Each Lathe is furnished with both large and small face plates, countershaft with patent friction pulleys, cone and hangers, wrenches, center rest and a full set of change gears for screw cutting, and all sizes up to and including 36 inch are strongly back-geared, and all sizes from 40 inch above are triple-geared. Taper attachment furnished extra if wanted.

We feel that for accuracy of work, ease of operation, durability and strength, these Lathes are bound to give satisfaction.

Swing over Bed	Regular Length Bed	Distance Between Centers	Diam. of Front Bearing	Width of Cone Belt	Weight of Lathe Complete
17 inch	6 feet	3 feet 0 inch	2 inch	2½ inch	1,650 lbs.
20 inch	8 feet	4 feet 0 inch	2½ inch	2¾ inch	2,600 lbs.
22 inch	8 feet	3 feet 6 inch	3½ inch	3½ inch	3,300 lbs.
23 inch	7 feet	3 feet 0 inch	3½ inch	3 inch	3,200 lbs.
26 inch	10 feet	5 feet 0 inch	4 inch	4 inch	4,600 lbs.
30 inch	12 feet	6 feet 0 inch	5 inch	4½ inch	6,500 lbs.
36 inch	12 feet	5 feet 0 inch	6 inch	4½ inch	9,500 lbs.
38 inch	12 feet	6 feet 0 inch	4¾ inch	4 inch	9,600 lbs.
40 inch	12 feet	4 feet 0 inch	7 inch	5 inch	13,000 lbs.
50 inch	14 feet	5 feet 6 inch	6 inch	5 inch	15,500 lbs.
52 inch	14 feet	5 feet 0 inch	12 inch	5 inch	16,000 lbs.
64 inch	14 feet	4 feet 0 inch	14 inch	5 inch	20,000 lbs.

Write for prices, stating sizes wanted.

MULLER ENGINE LATHES.**Plate 1296.**

These furnished any length of Bed, and with or without Taper attachment. See description on following page.

MULLER ENGINE LATHES.

(See cut on opposite page.)

These Lathes are of symmetrical and attractive outline, embodying in their construction advanced ideas and improvements for convenient and accurate work. They are built from entirely new patterns, designed with special reference to all the various and severe duties that modern shop practice requires. They are equally well adapted to either light or heavy work, and the most approved methods are used in fitting them up.

The material is carefully selected and of a nature best suited to the respective purposes. The spindles are of high grade hammered steel, and run in boxes of hard bronze metal which are of such form as to retain perfect alignment after considerable wear. Both the head spindle and the tail spindle are ground true, to size.

The feeding arrangements are entirely new, constructed so as to drive with either belt or gearing by the simple movement of either of the small gears into mesh on the feed rod.

The carriages have solid bearings on the V's the entire length, and are also gibbed full length to the outside of bed.

All the screws and small gears are made of steel. All the working parts are of ample size, strong and substantial, and well fitted by hand scraping.

The countershafts are fitted with patent friction pulleys of modern design.

We do not hesitate to recommend these in the highest degree as being first class.

Swing over Bed, In.	Swing over Rest, In.	Length of Bed, Ft.	Distance between Centers, Ft. In.		Size of Front Bearing, In.	Diam. Hole through Spindle, In.	Width of Cone Belt, In.	Wt. of Lathe of Length given, Lbs.	Price, at Stated Length Bed	Price, each Extra Foot Bed	Price, Extra for Compound Rest
14	9 $\frac{1}{8}$	6	3	5	2 $\frac{1}{8}$ x 2 $\frac{7}{8}$	1 $\frac{1}{8}$	2	1350	\$ 265 00	\$ 9 50	\$15 00
18	10 $\frac{7}{8}$	6	2	10	2 $\frac{5}{8}$ x 4 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{1}{2}$	1800	310 00	10 50	18 00
21	13 $\frac{3}{8}$	8	4	0	3 $\frac{1}{4}$ x 5 $\frac{1}{4}$	1 $\frac{1}{2}$	3 $\frac{1}{2}$	3000	450 00	13 50	22 00
25	16	10	5	6	4 x 6 $\frac{1}{4}$	2	3 $\frac{1}{2}$	5000	685 00	19 50	Included
*31	20	12	6	0	4 $\frac{1}{2}$ x 8	...	4	8500	1,000 00	27 50	Included

Lathes furnished any length bed desired.

Taper attachments furnished if wanted.

*The 31 inch Lathe can be furnished with 2 inch hole through spindle if desired, at additional price.

Write for prices stating sizes wanted.

YOUNG'S SCREW CUTTING ENGINE LATHES.

12, 14 AND 16 INCHES SWING.

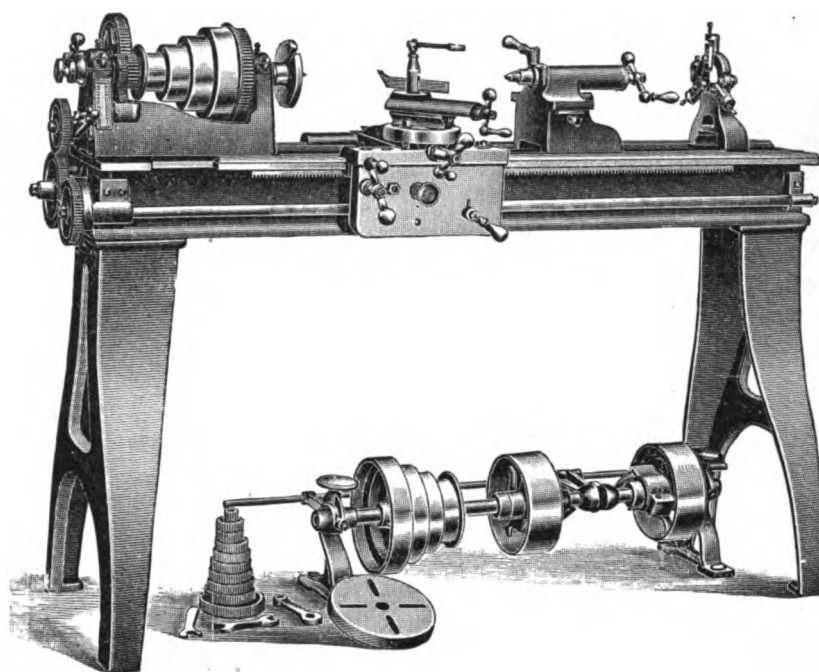
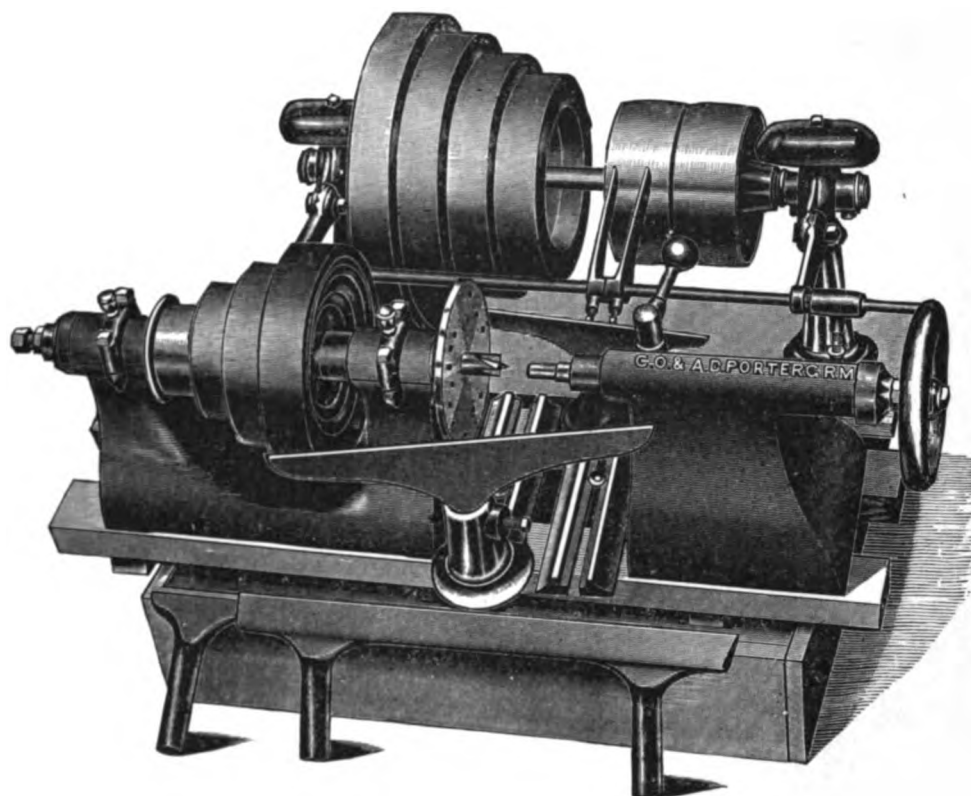


Plate 1297.

These Lathes have large Cones for wide belts. The Spindles are hollow and the Bearings are large and carefully fitted. The back gearing is in the proportion of 9 to 1, and the face of gear is equal to one-half the width of belt. With the Reverse Motion in the head these Lathes can be instantly made to cut right or left hand screws without any change of gears. They have Independent Rod and Friction Feed operated by a Milled Hand Wheel on the Apron. The Steel Lead Screw is used for thread cutting only, and is operated by an Open and Shut Nut, which can be clamped to the screw at any desired point. The Carriages have long, well fitted Bearings gibbed on both sides of the bed, and are furnished with either Raise or Fall or plain Rest and Forged Steel Tool Posts. The Tail Stocks are very stiff and have long Spindles of large diameter. These Lathes are thoroughly made of the best material, and all sliding parts are scraped to fit accurately. Each Lathe is provided with large and small face Plates, Center Rest, full set of change Gears, and Countershaft with patent friction Pulleys.

Swing over Bed	Length of Bed	Swing over Raise and Fall Rest	Swing over Plain Rest	Turn in Length	Weight about	Price
12 inch	6 feet	6 inch	7 inch	45 inch	900 lbs.	\$280 00
14 inch	6 feet	7 inch	8¼ inch	43 inch	1,100 lbs.	310 00
16 inch	6 feet	7½ inch	7¼ inch	38 inch	1,400 lbs.	350 00

PORTER WOOD TURNING LATHE.**Plate 1298.**

The above cut represents our New Improved Wood Lathe, designed for use with wooden shears. The head and tail stock are extra heavy, making it impossible to spring and bind the bearings, so they will heat (a fault with most of lathes), which we have overcome in our new pattern. The small pulley on the cone is iron, screwed on the spindle, the balance of cone is made of well seasoned cherry. The spindles are steel with extra long bearings.

We also manufacture Pattern or Double Head Lathes for pattern making, moldings, or large work (16 and 20-inch swing). These Lathes are provided with screws on both ends of the spindle, and one extra large face plate for the outer end of the spindle. The screws for taking up the end wear are held in removable brackets. When these brackets are taken off and the outer ends of the spindles are used, the wear is taken up by bringing the tail center against the inner ends.

PLAIN LATHES.

12 inch	\$.....
14 inch . . . . .	.....
16 inch . . . . .	.....
18 inch . . . . .	.....
20 inch . . . . .	.....

PATTERN LATHES.

12 inch	\$.....
14 inch . . . . .	.....
16 inch . . . . .	.....
18 inch . . . . .	.....
20 inch . . . . .	.....

We furnish these Lathes with the following:

One Face Plate, 1 set of Centers, 4 Rests from 6 to 24 inches long, 2 Steps for holding Rests, and a Steel Countershaft complete with Hangers, Cone, Tight and Loose Pulleys, Belt Shifter and Drip Cups.

Prices quoted on application.

TRAVERSE HEAD SHAPERS.

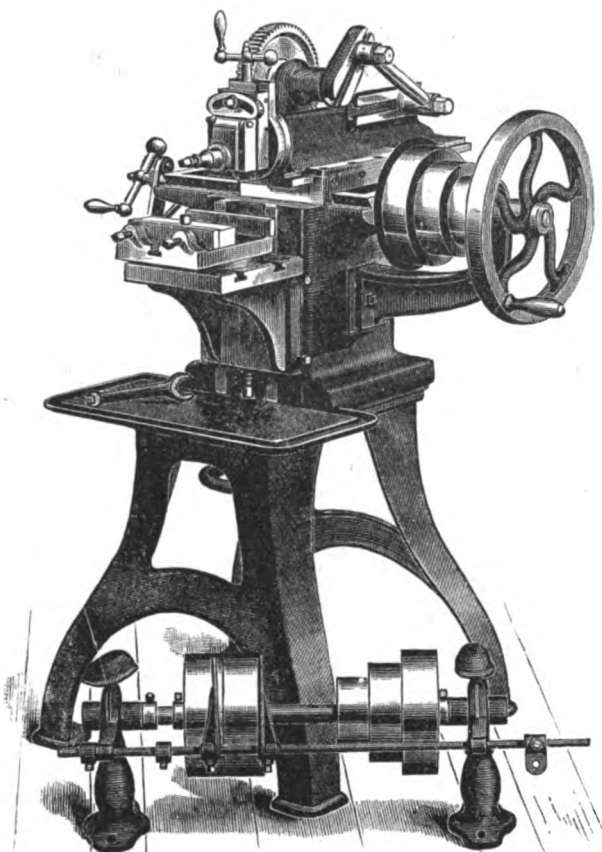
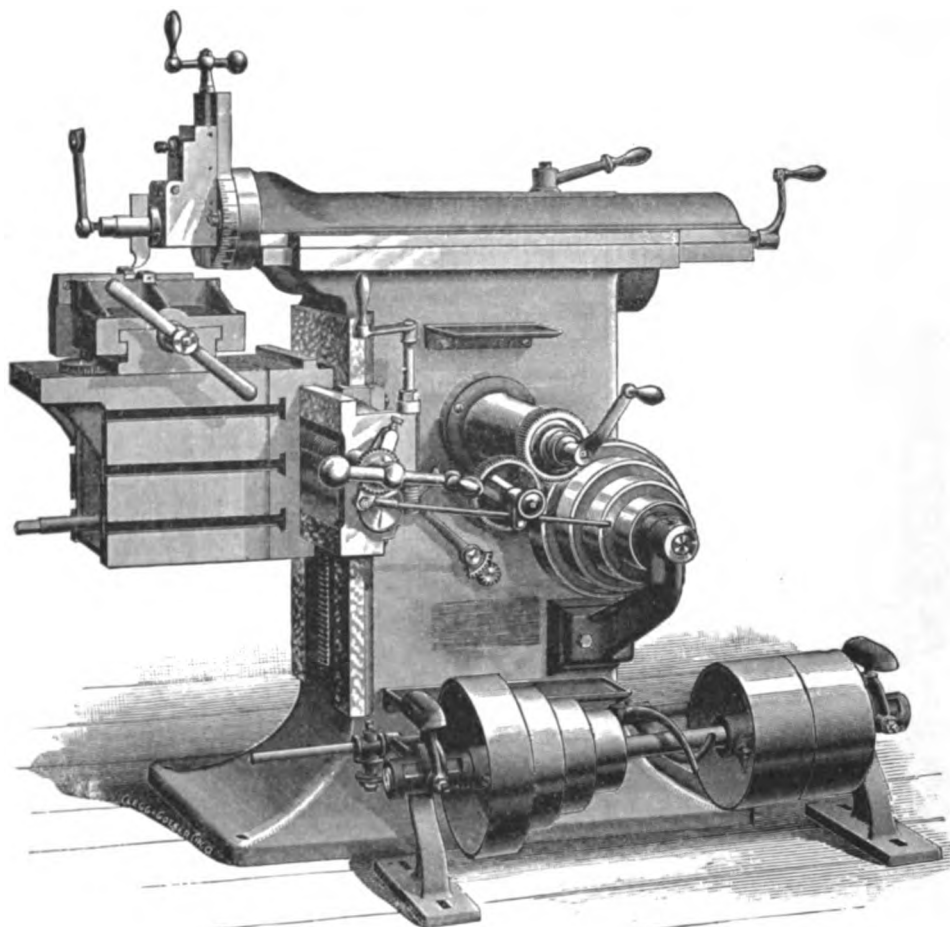


Plate 1299.

Length of Stroke	6 inch	8 inch
Length of Traverse	9 inch	12 inch
Greatest distance between Tool and Table	8 inch	10 inch
Driving Pulleys on Countershaft	6 x 2½ inch	8 x 2½ inch
Cone Pulley, 3 Steps	3, 4½ and 6 x 1¾ inch	4¾, 6¾ and 8 x 2 inch
Size of Swivel Chuck	7 x 4¼ x 1¼ inch	8 x 5½ x 1¼ inch
Weight	450 lbs.	750 lbs.
Countershaft, revolutions per minute	220	100
With Swivel Chuck, complete, as shown in cut	\$135 00	\$200 00
Hand Machine, without Cone and Countershaft	120 00	.....
Hand Machine on Bench, without Stand, etc.	110 00	.....
Plain Chuck, extra	9 inch, 9 00	12 inch, 12 00

Price of the 6 inch machine, with Countershaft and Swivel Chuck, with length of traverse 14 inches including Plain Chuck 14 inches long \$160 00

IMPROVED CRANK SHAPERS.**Plate 1300.**

This cut represents our Improved Crank Shaper, which is made in three sizes. We have endeavored to make them the simplest, strongest and most powerful, as well as durable machines made, and we cheerfully recommend them to any wishing first-class tools.

The vise is swiveled and supplied with a pair of adjustable centers for light work. The tool head is graduated and can be set to any angle. The stroke is at all times positive, and can be adjusted while machine is in motion.

When it is not convenient to use the vise, it may be removed, and work can be bolted to the top or sides of the table, or the table can be taken off and work bolted direct to the apron, thus enabling the machine to cover a large range.

The machines are heavily geared, giving great power, and have quick return; the gears are turned and cut from the solid, studs and shafts are made of the best of steel, sliding surfaces are accurately scraped, and each machine thoroughly tested before it leaves the factory.

Stroke	16 inch	18 inch	22 inch
Cross Traverse	24 inch	25 inch	26 inch
Size Top of Table	11 x 15 inch	12 x 16 inch	13 x 18 inch
Vertical Adjustment of Table	17 inch	17 inch	17½ inch
Vertical Feed of Tool	9 inch	9 inch	9 inch
Bearing of Ram in Column	28 inch	28 inch	32 inch
Number of Steps on Cone	4	4	4
Width of Belt	2¼ inch	3 inch	3 inch
Swivel Vise opens	8 inch	10 inch	11 inch
Size of Steel Jaws	2¼ x 10 inch	2¼ x 10 inch	2¼ x 10 inch
Tight and loose Pulleys	10 x 4 inch	10 x 4 inch	10 x 4 inch
Speed of Countershaft	200	200	200
Weight of Machine, complete	1,600 lbs.	1,750 lbs.	2,000 lbs.
Prices . . . . .	.....	.....	.....

TRIPLE-GEARED SHAPERS.

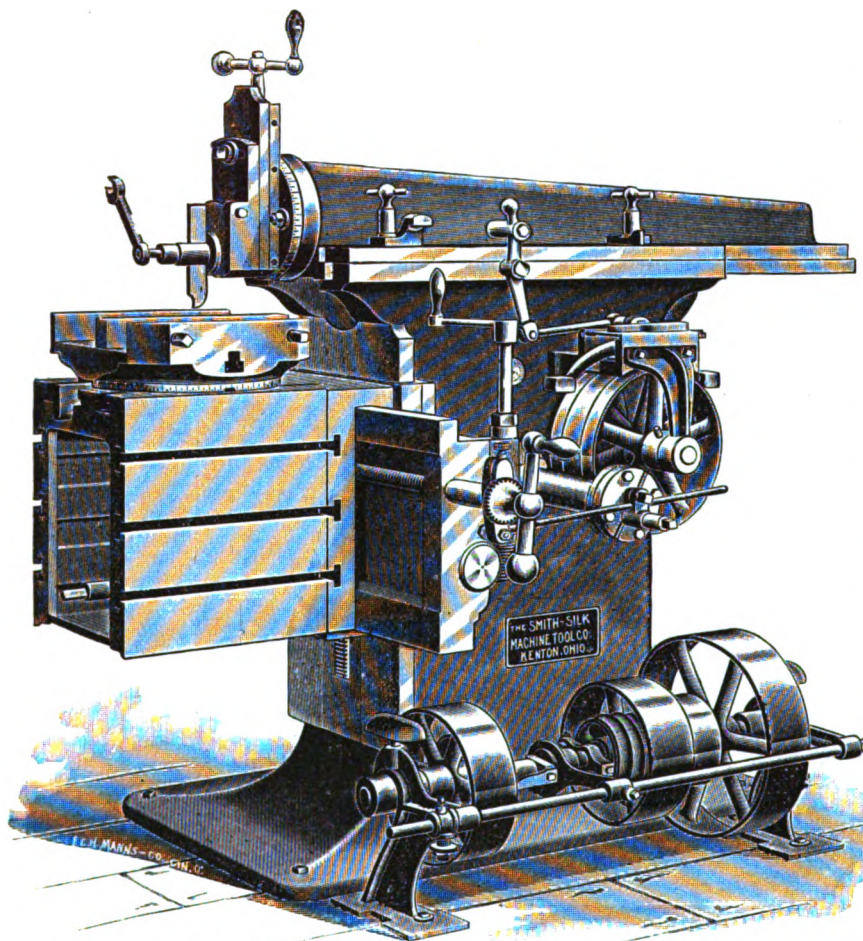


Plate 1301.

The cutter bar or ram is driven by two bull wheels of large diameters, operating in double racks. The driving pinions and shafts are of steel. The box-table may be removed and work bolted to the slotted apron to which table is attached. This is very desirable in planing the sides and tops of heavy pieces.

These Shapers are furnished with our new Shifting Device, which is simple, positive and noiseless.

The workmanship and material are of the best, and for truth and accuracy these Shapers can not be excelled. Countershaft is furnished with two changes of speed, and back motion is made two to one.

Size	21 in.	28 in.
Length of Full Stroke	23 in.	32 in.
Cross Traverse of Table	25 in.	30 in.
Bearing of Ram on Column	26 in.	34 in.
Vertical Adjustment of Table	16½ in.	15¾ in.
Size Top of Table	13 x 17 in.	14 x 20 in.
Feed of Tool Block	10 in.	10 in.
Swivel Vise Opens	11½ in.	11½ in.
Ratio Backward to Forward Stroke of Ram	2½ to 1 in.	2½ to 1 in.
Speed Pulleys on Center Shaft	8 & 18 in.	8 & 18 in.
Driving Pulleys on Center Shaft	12 in.	12 in.
Driving Pulleys on Shaper	13 in.	12 in.
Speed of Counter Shaft	280	280
Weight of Machine, complete	1,900 lbs.	2,600 lbs.
Price . . . . .	.....	.....

Vise, Wrenches and Countershaft furnished with each machine.

Circular attachment and Moldmaker's vise can be furnished if wanted, but are extras.

We can, at a slight advance in price, furnish power-down feed.

The illustration here-with represents our new Triple-Geared Shaper. We have recently added several new features to these machines, and considering weight, convenience of handling, and durability, we believe that they are the best tools of this class on the market.

In designing these machines, great care has been taken to give ample stiffness to resist strain of cutting tool. There is also a much greater range in every way than is usually furnished with a tool of this kind.

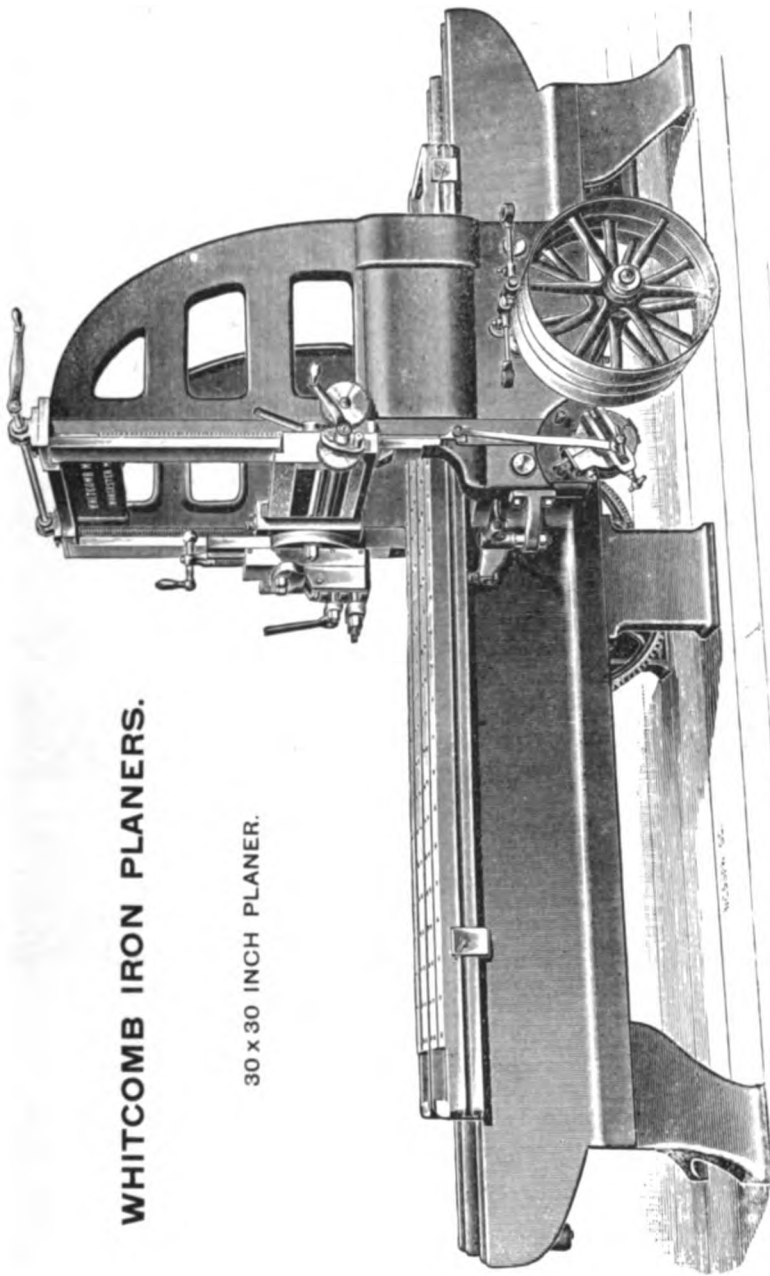
The stroke of these Shapers can be changed while the machine is running.

The head is graduated and gears are compound, giving great power.

The vise is indexed, and can be bolted to either side of the box-table, at any angle.

The vertical adjustment of table is made with worm and wheel, operating a pinion working into a rack, and is raised and lowered at the same end of cross-head at which the operator is standing. This enables him to make every movement necessary for working the machine without altering his position or even stopping the Shaper. This will be recognized as a great saving of time where a large variety of work is being done, or, in fact, under any circumstances.

There is an open space under the ram that admits long lengths of iron clear through, which is very convenient in cutting keyways in shafts of any length.

WHITCOMB IRON PLANERS.**30 x 30 INCH PLANNER.****Plate 1302.**

These Planers are built from recent patterns and contain many improvements.

They are very heavy and well-proportioned, powerfully geared and capable of doing heavy and light work with great accuracy. They have large steel shafting. Extra long bearings with cap boxes. All gears and racks accurately cut from solid blanks. Patent Track Lubricators, a simple and exceedingly valuable device which keeps tracks perfectly oiled.

Slots in table planed from the solid. Holes in table drilled and reamed. Quick return. Patent friction feed, entirely disconnected from shipper. Patent cross-head fastening, a powerful clamping device operated by one motion of a conveniently situated lever, thoroughly effectual and durable.

Best self-acting horizontal, vertical and angular feeds. Cross-head fits all carefully scraped. The tool-block may be raised or lowered by means of the crank-handle at the end of cross-bar. By means of the offsets in the uprights, shown in cut, the capacity of the Planer is increased by about 3 inches in width for about 6 inches above the table. Countershaft and Wrenches with each machine.

Plane in Width		Plane in Height		Plane in Length		Weight, Complete		Weight, Each Extra Foot
17 inches	...	17 inches	...	3 feet	...	2,500 pounds	...	300 pounds
22 inches	...	22 inches	...	4 feet	...	3,400 pounds	...	300 pounds
24 inches	...	24 inches	...	5 feet	...	4,700 pounds	...	500 pounds
27 inches	...	27 inches	...	5 feet	...	5,800 pounds	...	500 pounds
30 inches	...	30 inches	...	6 feet	...	6,800 pounds	...	600 pounds
36 inches	...	36 inches	...	6 feet	...	10,000 pounds	...	750 pounds
42 inches	...	42 inches	...	8 feet	...	14,000 pounds	...	1000 pounds

The above can be furnished any length required. Special prices quoted on larger sizes.

POWELL'S IRON PLANERS.

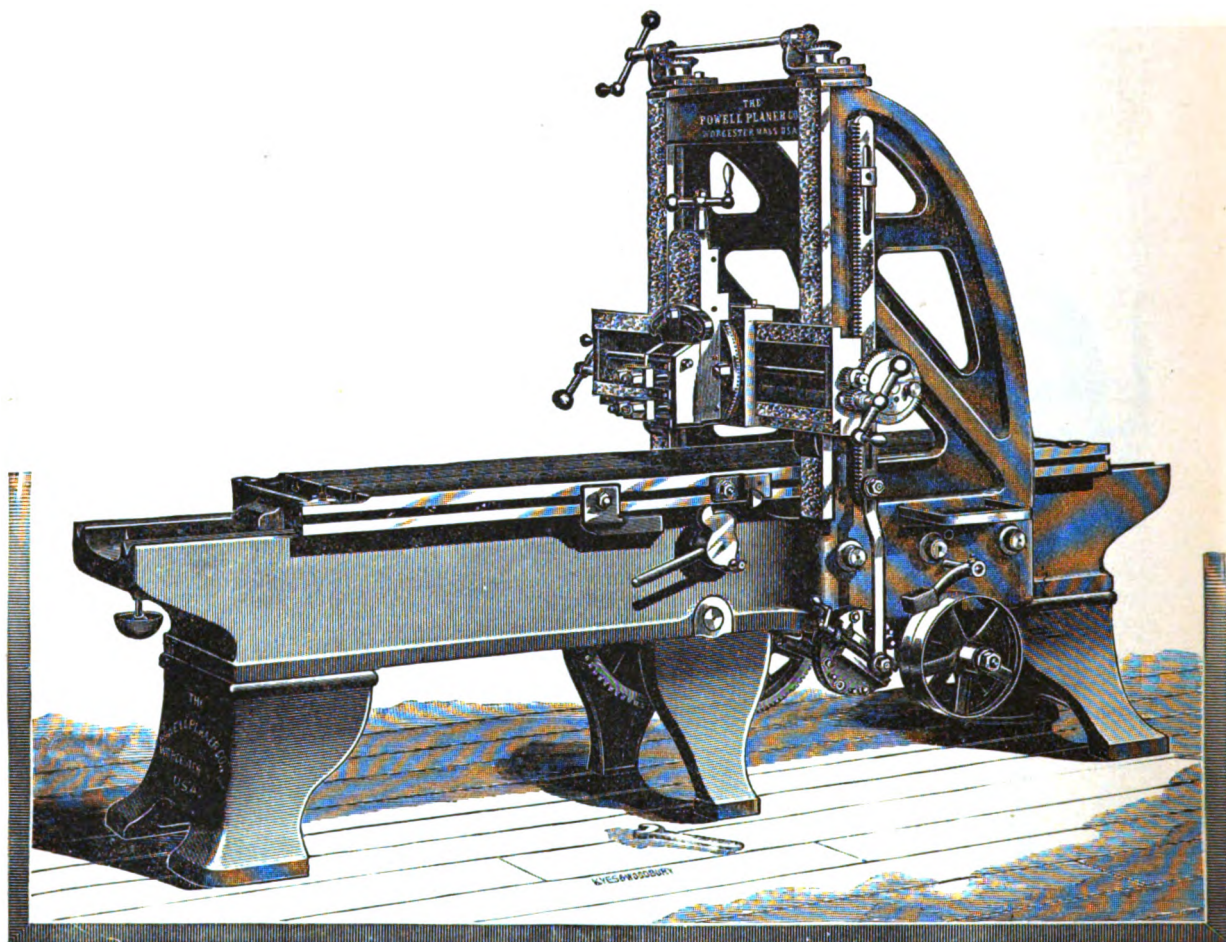


Plate 1303.

BED is very heavy: box girders placed at short distances apart.

TABLE is thick; pin holes are drilled and hand-reamed or cored when desired; rack is made in short sections.

GEARING RATIO is calculated for great power; pinion gears are made from hammered steel; all rack and gear teeth are cut from solid stock; driving gears are contained inside the bed, and are mounted on three steel shafts of large diameter and run in very long boxes, which come close to the gears.

DRIVING-SHAFT.—There is one tight and one loose pulley on each side of the planer, the loose pulleys having a very long hub.

BELT-SHIFTER is a cam device which shifts one belt before the other, and is controlled by hand lever at side of the bed. There is a device on the rocker for locking the shipper when the belts are on the loose pulleys, which prevents belts from working onto tight pulleys and accidentally starting the table.

CROSS-RAIL is of sufficient length so that the swivel on head can be set to plane an angle of 45 degrees on a piece as wide as will pass between the housings. Screws for raising and lowering the Cross-rail are accurately cut and nicely adjusted, so that the Cross-rail is in alignment with the Table, whether Rail is at its lowest or highest point.

FEED-WORKS are very simple, and designed to give a fine feed, or one that is very wide for smoothing cuts.

HOUSINGS have a wide face, and wide at the base on side of planer, with a brace running from the base diagonally to the face, which makes the post doubly rigid.

All wearing surfaces are hand scraped to fit. No emery is used in making fits.

REGULAR SIZES.

Plane in Width.	Plane in Height.	Plane in Length.	Weight, Complete.	Weight, each Extra Foot.
22½ in.	22½ in.	4 ft.	4,000 lbs.	250 lbs.
24½ in.	24½ in.	5 ft.	5,300 lbs.	300 lbs.
28½ in.	28½ in.	6 ft.	6,000 lbs.	400 lbs.
30½ in.	30½ in.	6 ft.	8,000 lbs.	500 lbs.
32½ in.	32½ in.	6 ft.	9,500 lbs.	750 lbs.
37 in.	37 in.	8 ft.	14,000 lbs.	800 lbs.
43 in.	43 in.	10 ft.	25,000 lbs.	1,000 lbs.
49 in.	49 in.	10 ft.	31,500 lbs.	1,250 lbs.
55 in.	55 in.	10 ft.	37,000 lbs.	1,500 lbs.
61 in.	61 in.	12 ft.	44,000 lbs.	1,750 lbs.
67 in.	67 in.	12 ft.	48,000 lbs.	1,750 lbs.
73 in.	73 in.	12 ft.	54,000 lbs.	2,000 lbs.
85 in.	85 in.	12 ft.	58,000 lbs.	3,000 lbs.
97 in.	97 in.	12 ft.	69,000 lbs.	4,000 lbs.

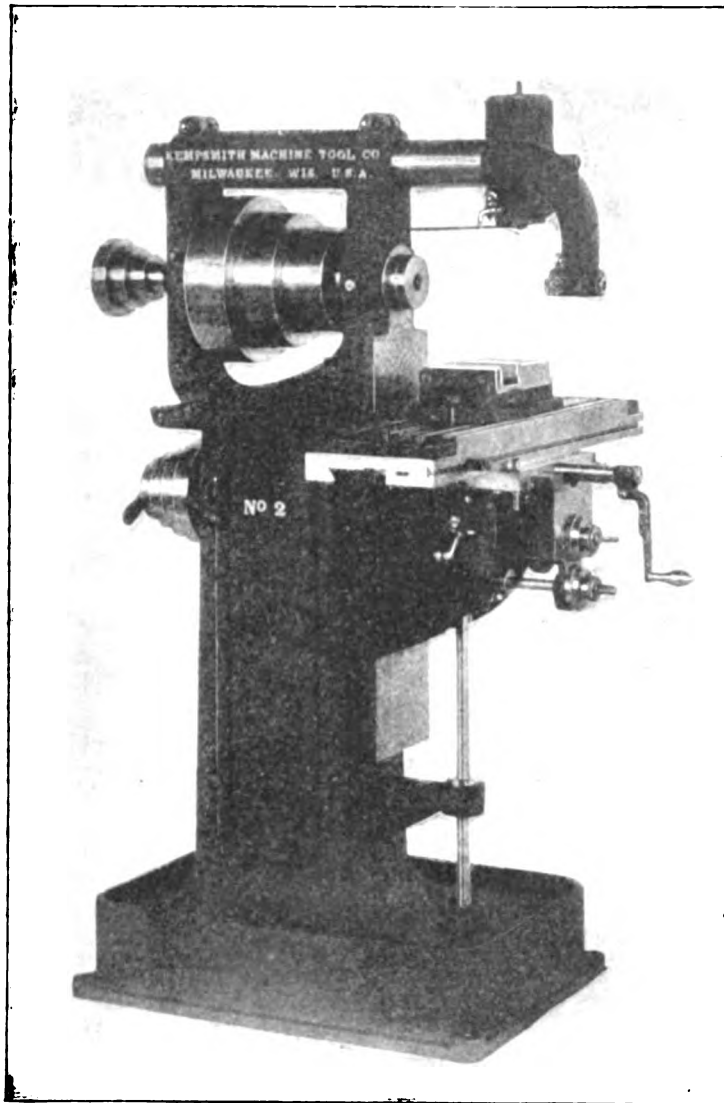
SPECIAL SIZES.

Plane in Width.	Plane in Height.	Plane in Length.	Weight, Complete.	Weight, each Extra Foot.
36½ in.	30½ in.	8 ft.	10,000 lbs.	500 lbs.
42½ in.	30½ in.	8 ft.	11,000 lbs.	600 lbs.
36½ in.	32½ in.	8 ft.	12,500 lbs.	750 lbs.
42½ in.	32½ in.	8 ft.	13,500 lbs.	750 lbs.
43 in.	37 in.	8 ft.	15,500 lbs.	750 lbs.
51 in.	37 in.	8 ft.	16,500 lbs.	750 lbs.
82 in.	51 in.	8 ft.	20,000 lbs.	1,000 lbs.

Planers furnished any length desired, and any combination of sizes other than the above, and any number of Heads.

We also furnish Valve Planers for planing 3 sides at once.

Write for prices, stating size wanted.

No. 2 PLAIN MILLING MACHINE.**Plate 1304.**

This Machine was designed for rapid handling of light work, such as electrical, gun, sewing machine and bicycle factories are required to produce in large quantities.

The column is of improved construction, has a cupboard base with shelves, and the upright spindle bearings are tied together by a bridge cast in one piece with the column. The liquids used in cutting, not arrested by the channels and pans on the table, are caught by the pan forming the foot of the column. This makes a neat arrangement and keeps the floor clean.

The spindle of forged crucible steel is hollow its entire length and has Brown and Sharpe No. 9 taper hole. The front bearing is taper, rear bearing parallel. Efficient means are provided to take up all lost motion in both bearings, without disturbing alignment.

The knee has a vertical movement of $14\frac{1}{2}$ inches and the saddle a cross movement of $3\frac{3}{4}$ inches; both of these movements are indexed and read in thousandths of an inch.

The table has three tee slots and has a working surface 8 inches by 24 inches, an automatic rack feed of 23 inches, and the feed can be tripped automatically with the table moving in either direction.

The feed has four changes and is reversible, without

changing the belt. Adjustment to take up wear is provided wherever looseness would affect the accuracy of the machine. The vise accompanying the machine has jaws $5\frac{1}{8}$ inches wide, $1\frac{1}{8}$ inches deep and will open $3\frac{1}{4}$ inches without the steel jaws. It is of the flanged type and can be firmly fastened to the table by two bolts. Steel tongues and right angle grooves are provided for accurate locating.

Everything shown in cut is furnished with each machine, including a countershaft with two friction pulleys, 10 inch diameter for $2\frac{3}{4}$ inch belt. Countershafts should run 110 revolutions per minute.

Cone Pulleys, largest step	10½ inch
Width of Belt	2¾ inch
Vertical Adjustment	14½ inch
In and Out	3¾ inch
Length of Power Feed	23 inch
Length of Table	30 inch
Width of Table	8 inch

Diameter largest part front spindle bearing $2\frac{1}{2}$ x 4 inches long. Weight, 1100 pounds.

Other styles and sizes. Write for circulars.

THE UNIVERSAL MILLING MACHINE.

No. 0.

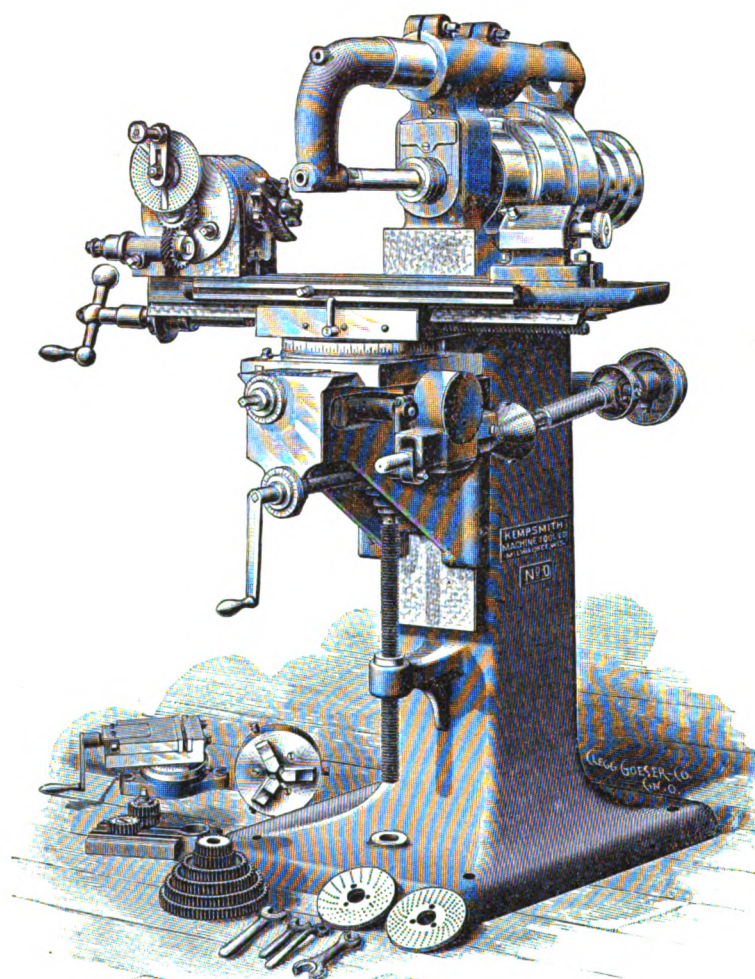


Plate 1305.

center, so that shank or end milling cutters can be used as close to the inner side of center as to the top. This feature dispenses largely with the use of extremely small diameter cutters, and increases the quantity and improves the quality of work that can be produced on a milling machine. Adjustment to take up wear is provided wherever lost motion would affect the accuracy of the machine. All of the materials used are the best for the purpose, and we aim to make this machine equal to the best in workmanship. A Double Friction Countershaft of improved construction, requiring only one adjustment to tighten its grip, together with everything shown in cut, is furnished with each machine. The Countershaft has ten inch pulley for $2\frac{3}{4}$ inch belt, and should run one hundred and forty revolutions per minute.

Cone Pulley, largest step	10 $\frac{1}{2}$ inch
Width of Belt	2 $\frac{3}{4}$ inch
Vertical Adjustment	14 $\frac{1}{2}$ inch
In and Out	4 $\frac{1}{2}$ inch
Length of Power Feed	18 inch
Length of Table including Oil Pans	33 inch
Width of Table including Oil Pans	6 $\frac{3}{4}$ inch
Swing of Center	8 $\frac{1}{4}$ inch
Length between Centers	14 inch
Size of Front Spindle Bearing	2 x 3 $\frac{3}{4}$ inch
Taper Hole in Spindle and Universal Head	No. 9
Weight	1,200 pounds

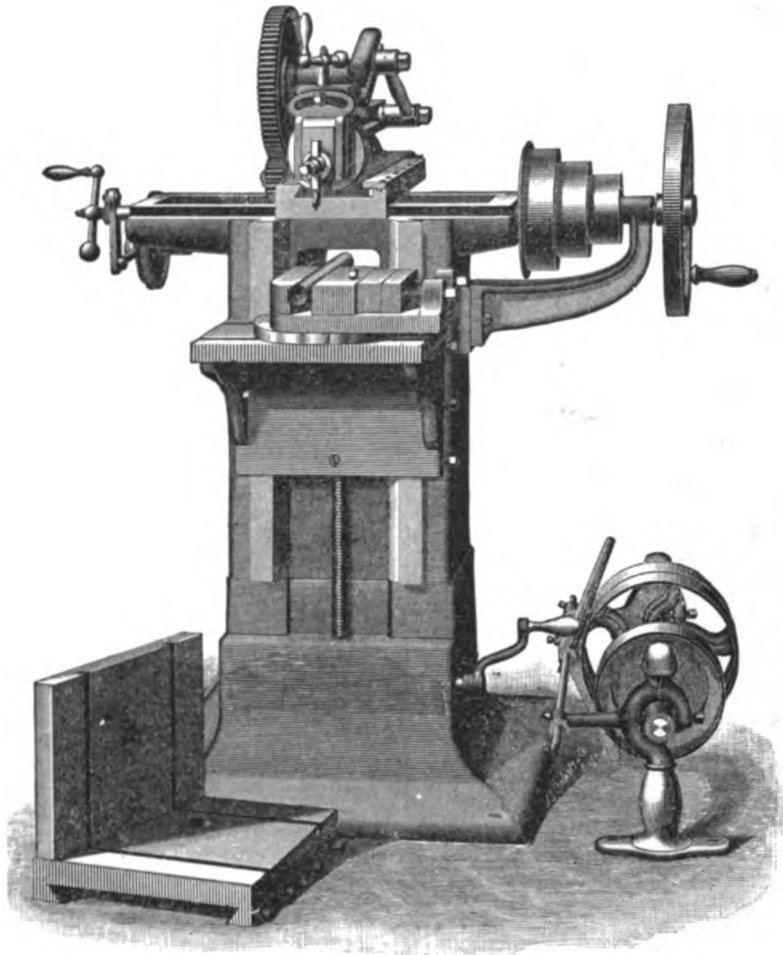
Special prices quoted on application.

Other Styles and Sizes. Write for Circulars.

This Universal Milling Machine was designed to meet the most exacting requirements of small tool and model making. Its size makes it especially adapted for convenient and sensitive handling on the lightest and finest class of work. The Table can be swiveled to any angle, and has power feed and automatic trip in every position. The Feed has four changes and is tripped automatically or by hand, under full cut, as easily as when the Table is running empty. A full range of spirals, right and left hand, can be cut from one turn in one inch to one turn in one hundred inches, by both simple and compound gearing. For every-day practice the range of simple geared spirals is amply sufficient, and the gears are as readily changed as on an ordinary screw cutting lathe. The Spindle is of forged crucible steel, hollow its entire length, and the front end threaded and hole tapered, so that arbors and chucks fitting Spiral Head, will interchange with main spindle. The Spiral Head is constructed on entirely new lines, and possesses in a marked degree, the desirable qualities of accuracy and rigidity in all positions. It can be revolved through an arc of two hundred and ten degrees, and can be used on either end of Table. The Spindle of the head is hollow, allowing pieces 15-16 inches in diameter to pass clear through. The Cone Pulley has its smallest step toward the front, which permits the top of the column to slope upward toward the front spindle bearing, bracing it and securing rigidity. The two spindle bearings are tied together by an arch at the top, which also supports the overhanging arm. A bearing nine inches long is bored in the arch, slotted at the top and provided with two clamping screws. The arm can be quickly inserted, clamped fast, and as quickly removed. The Spindle Boxes are of bronze, made in halves. They are cylindrical in form, with a deep rib running around the middle, face square with the turned surface, and forced into a groove cut into the column and box cap. The outside of the box is finished entirely in the lathe, which makes its reproduction when worn out, a simple matter. The elevation to the knee and the cross motion is indexed, and read in thousandths of an inch. The Foot Stock of centers has a valuable feature in the placing of the

TRAVERSE HEAD SHAPER.

10 INCH.

**Plate 1306.**

The 10 inch machine, being on a pedestal, admits the placing of long work in front of the machine, for which there is provided a face plate for attaching such work as legs of machines, etc., and to which also may be attached an angle plate either in a right or left-hand position and at any angle with the face plate, thus enabling the planing of any bevel or angle required. The swivel chuck may be fastened to either the face plate or angle plate.

Length of Stroke	10 inches
Length of Traverse	15 inches
Greatest Distance between Tool and Table	18 inches
Distance under Tool after Removing Table, for long work	36 inches
Driving Pulley on Countershaft	10 x 2½ inches
Cone Pulleys, 3 Steps	4¾, 6¾, 8, x 2 inches
Size of Swivel Chuck, 9½ inches long, 6 inches between Jaws	1½ inches deep
Weight	1,000 pounds
Countershaft, Revolutions per minute	100
Price, with Swivel Chuck	\$250 00
Front Face Plate, extra	16 00
Angle Plate, extra	14 00
Plain Chuck, 15 inches long, extra	15 00

POWER METAL SHOP SAW.

WITH AUTOMATIC FEED.

FOR CUTTING ALL KINDS OF METAL, IRON, STEEL, BRASS AND CASTINGS, INCLUDING TOOL STEEL.

Capacity, 5 Inches and Less.

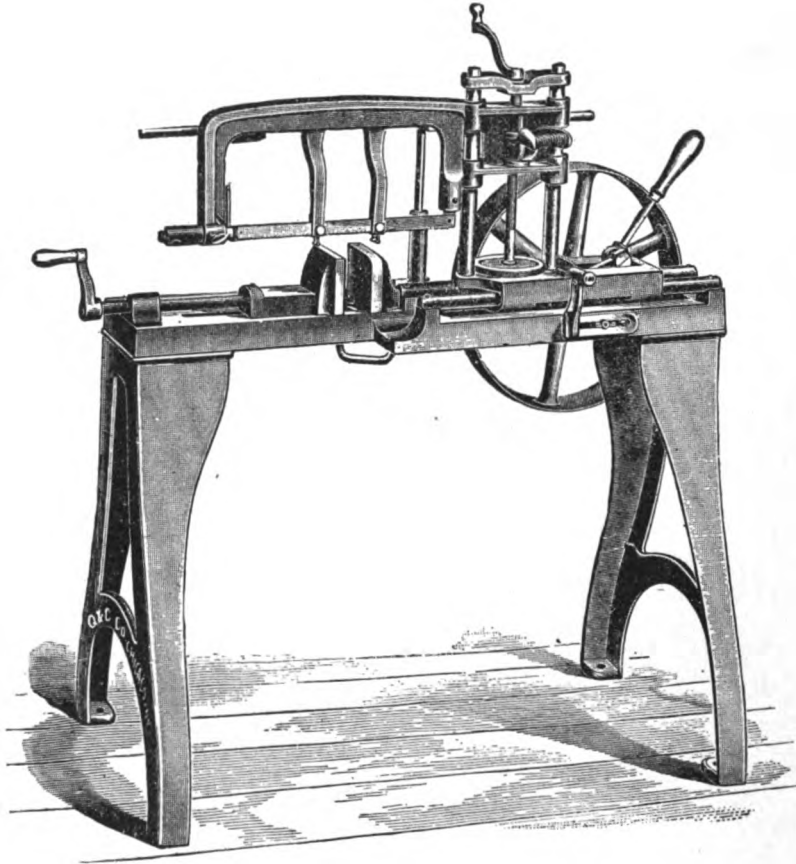


Plate 1307.

The Q & C Shop Saw is a great improvement over the gravity feed or hack saw; has positive feed, entirely automatic, and speed can be instantly changed to accommodate all classes of work.

The common hack saws depend entirely upon gravity to feed the saw through the work, and, as the weight of saw frame cannot be increased, the cutting speed diminishes as the size of work increases, whereas, with the Q & C Shop Saw, having automatic screw feed, the same cutting speed is maintained throughout.

The old style machines drag the blades backward on the return stroke with nearly, if not quite, as much pressure as when cutting, destroying the keenness of the edge as well as the blade itself in a short while. The Q & C Shop Saw clears the metal on return stroke, effecting an actual saving of 50 per cent of wear; a single blade lasting from three days to two weeks. Our special saw blades are superior to all others.

The Q & C Shop Saw was specially designed to overcome the known weaknesses of the old style machines, which are very slow and very expensive to keep supplied with saw blades; one of our special blades will outwear several dozen of the old style.

These machines are supplied with movable vise, allowing use of entire blade, also double adjustable guards to hold the blade firmly, insuring true work.

Price of the Q & C Shop Saw, including Six Special Saw Blades, each Machine fully guaranteed, \$25.00. If larger sizes are wanted, write us for particulars, stating capacity desired.

THE BRADLEY CUSHIONED HELVE HAMMER.

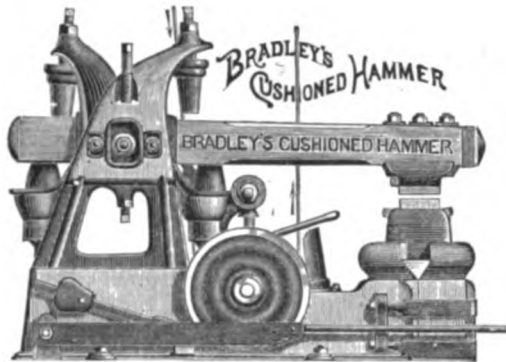


Plate 1308.

Made in seven sizes from
15 to 200 pound Heads.

This Hammer is made (except the helve and cushions) entirely of iron and steel, and so proportioned as to insure the greatest possible strength with the least amount of metal. The rubber cushions are the best that can be obtained, and are so arranged as to absorb the concussion of the blow of this hammer, thus materially relieving the other parts from the strain and jar to which they are ordinarily subjected, besides adding force and power to the blow. The helve is hung upon two hardened adjustable steel centers, and almost perfectly balanced, and is put in motion by a broad eccentric made up of an iron hub, a shell of the best anti-friction metal, and a cast steel strap, all so perfectly fitted as to run almost free from friction, and to be entirely adjustable.

Size of Hammer	List Price	Diam. of Driving Pulley	Width of Belt	Estimated Horse Power Required	Average No. of Blows per Minute	Average Size of Iron for which Suited	Floor Space	Weight, Lbs.
15 lbs.	\$200 00	.....	.....	.....	.....	.....	21x50	1100
25 lbs.	300 00	12 in.	3 in.	$\frac{3}{4}$ to 1	400	1 in.	23x60	1800
40 lbs.	450 00	14 in.	4 in.	1 $\frac{1}{2}$ to 2	300 to 315	1 $\frac{1}{4}$ in.	29x76	3000
60 lbs.	600 00	18 in.	6 in.	2 to 2 $\frac{1}{2}$	290 to 300	1 $\frac{3}{4}$ in.	33x83	4500
80 lbs.	750 00	18 in.	6 in.	2 $\frac{1}{2}$ to 3	275	2 in.	37x89	5600
100 lbs.	850 00	18 in.	6 in.	2 $\frac{1}{2}$ to 3	275	2 $\frac{1}{2}$ in.	37x90	5800
200 lbs.	1,000 00	26 in.	8 in.	3 to 3 $\frac{1}{2}$	225 to 240	3 $\frac{1}{2}$ to 4 in.	40x100	9500

These estimates are for iron. Reduce the size one-third for steel.

THE BRADLEY UPRIGHT CUSHIONED STRAP HAMMER.

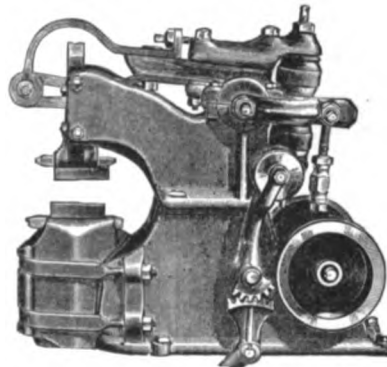


Plate 1309.

Made in ten sizes from 15 to
500 pound Heads.

Every working part of the entire Hammer is in full view of the operator, and the whole is so simple in construction and manner of adjustment that the most inexperienced hammersman has no trouble in operating it to its full capacity at once. A split friction sleeve on the pitman at the rear of the Hammer allows the length of stroke to be instantly adjusted—a matter of great value when material greatly differing in size has to be successively worked—a point that every hammersman will at once appreciate. The tension of the strap carrying the ram is adjusted quickly and in a very simple manner, while the force and rapidity of the blow is under complete control of the operator by means of the foot treadle acting on the belt tightener pulley. The greater the pressure of the foot, the heavier the blow.

Size	Floor Space	Weight	Price	Size	Floor Space	Weight	Price
15 lbs.	16x37 in.	700 lbs.	\$200 00	125 lbs.	30x61 in.	4300 lbs.	\$ 650 00
30 lbs.	23x48 in.	1800 lbs.	300 00	150 lbs.	31x70 in.	5200 lbs.	750 00
50 lbs.	27x55 in.	2800 lbs.	450 00	200 lbs.	32x78 in.	6000 lbs.	850 00
75 lbs.	27x55 in.	2800 lbs.	500 00	300 lbs.	38x86 in.	9500 lbs.	1,000 00
100 lbs.	30x61 in.	4200 lbs.	600 00	500 lbs.	41x97 in.	12500 lbs.	1,200 00

IMPROVED PATENT STEAM HAMMERS.

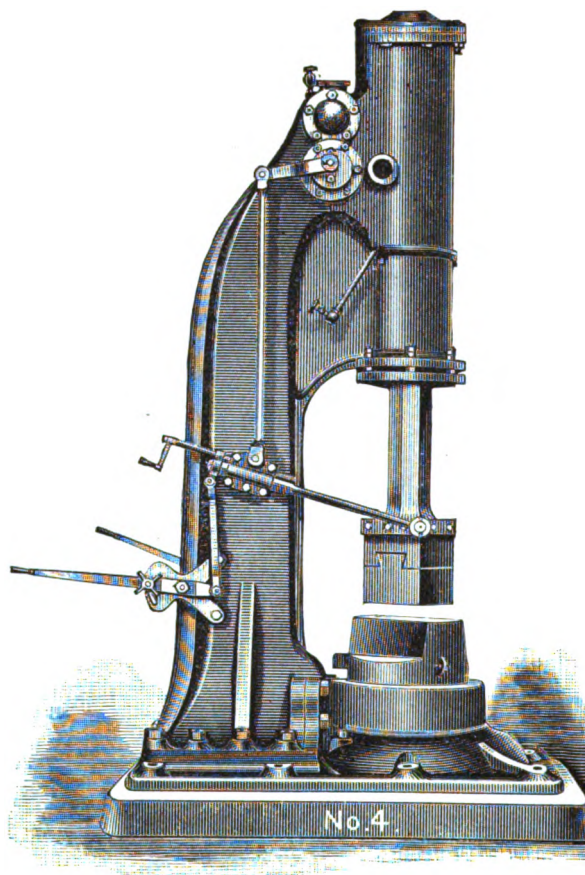


Plate 1310.

The advantages obtained by the use of Steam Hammers are now universally recognized, not only in rolling mills and large forges, but in every ordinary smiths' shop, by which a great saving of wages, time, fuel and material is effected, besides improving the character of the work. Various systems have been invented and adopted to meet the want, but the cost has been the great obstacle to the introduction. This Hammer has completely overcome this obstacle. It is of a very simple construction, having single column standard, with bed-plate and cylinder cast in one piece, very strong, self-acting, and taking steam at both ends of the cylinder, all of the sizes striking a square blow. Either of the sizes will strike a heavy or light blow, as required, and can be worked, either double-acting or single-acting, the change being easily and quickly effected. It is far superior to all belt, trip and helve hammers—easier to manage and keep in repair, and at least fifty per cent cheaper than any hammer yet invented that will do the same work. Nos. 2 and 3 sizes will work up old car axles and make the best iron that can be produced for connecting rods, eccentric rods, and all parts of engines and other machinery where the best quality of iron is required. They will also work up old scrap, quantities of which is always to be found in a blacksmith shop, and produce the best of iron for all ordinary purposes. No. 4 has been constructed with a view to furnish at a very moderate price, a hammer that will forge large and heavy cranks and shafts, and the frames and other bearings connected with locomotives, not only with expedition, but with the greatest accuracy and saving of labor. With a heating furnace it will work up scraps into billets for making car axles, crank shafts, and all heavy forgings which have heretofore required large and very expensive hammers to accomplish.

	No. 1	No. 2	No. 3	No. 4
Diameter and Stroke Piston	6 x 16 in.	8 x 18 in.	10 x 22 in.	12 x 27 in.
Weight of Falling Parts	300 lbs.	400 lbs.	700 lbs.	1,500 lbs.
Strike a blow of	2,000 lbs.	4,000 lbs.	6,000 lbs.	10,000 lbs.
Diam. of Shaft will Beat out at a single heat	4 in.	6 in.	7 in.	9 in.
Size of Base	28 x 42 in.	33 x 48 in.	38 x 58 in.	51 x 72 in.
Total Height	7½ ft.	8 ft.	9 ft. 3 in.	12 ft.
Weight, complete	3,800 lbs.	5,200 lbs.	7,500 lbs.	14,000 lbs.
No. of Blows per Minute	250	200	150	100
Price	\$525 00	\$725 00	\$975 00	\$1,750 00

RAND'S LITTLE GIANT ROCK DRILL.

This engraving represents our latest improved Little Giant Drill, size No. 3 $\frac{1}{4}$. The leading features are the same that have given this drill its wide reputation. The valve of the Little Giant Drill is a plain slide valve always thrown in the same direction in which the piston is moving, and the port remaining open until the full stroke has been made. The valve is operated by a three-arm lever called the rocker, which is held in place by a pin; the rocker is placed in a recess of the cylinder between the ends of a double-headed piston, and its upper arm or head engages into the valve; as the piston reciprocates it moves the rocker in the same direction in which it is going, and thus moves the valve with it. This positive valve movement insures certain operation when steam or air is admitted, without depending upon close fits or clean parts. It allows of a variation in design between the up and down stroke, thus economizing steam and increasing the working capacity of the machine. The whole mechanism is so simple and direct that there is never any difficulty in running at any desired speed, as high as 500 double strokes per minute having been made, the double stroke meaning the forward and backward motion of the piston. The Little Giant has a remarkable freedom from waste of power, as there is no leakage after long and constant use.

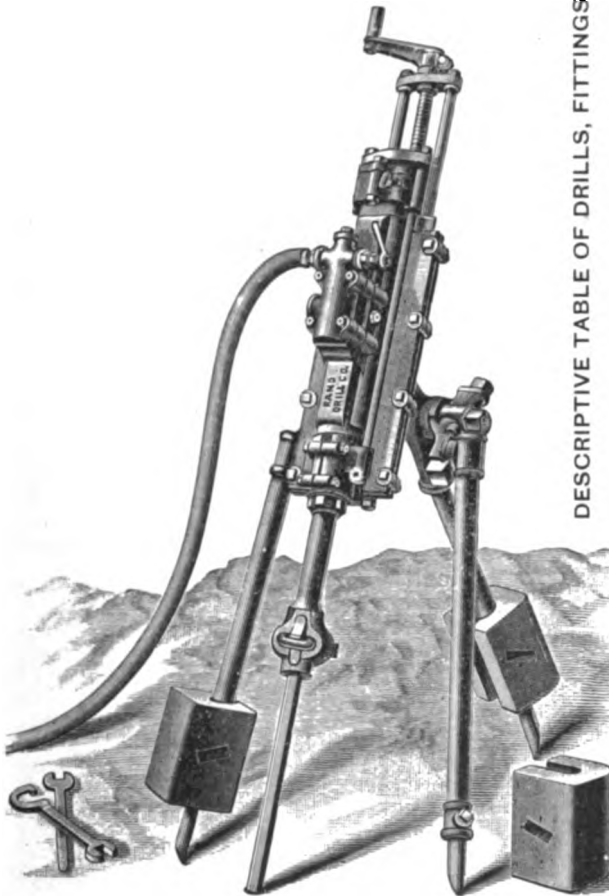


Plate 1311.

DESCRIPTIVE TABLE OF DRILLS, FITTINGS AND MOUNTINGS.

Name and Number of Drill	Kid Drill for Block Helling	Little Giant No. 1	Little Giant No. 2 and Slugger No. 12	Little Giant No. 3 and Slugger No. 13	Little Giant No. 3 $\frac{1}{4}$	Little Giant No. 4 and Slugger No. 14	Little Giant No. 5
Diameter of cylinder, Little Giant	1 $\frac{7}{8}$ in.	2 $\frac{1}{4}$ in.	2 $\frac{3}{4}$ in.	3 $\frac{1}{2}$ in.	3 $\frac{1}{4}$ in.	3 $\frac{3}{8}$ in.	4 $\frac{1}{2}$ in.
Diameter of cylinder, Slugger	3 $\frac{3}{8}$ in.	5 $\frac{1}{2}$ in.	6 $\frac{1}{4}$ in.	3 $\frac{1}{2}$ in.	6 $\frac{1}{2}$ in.	7 $\frac{1}{4}$ in.	7 $\frac{1}{2}$ in.
Length of stroke	10 in.	15 in.	1 ft. 6 in.	2 ft.	2 ft.	2 ft. 6 in.	2 ft. 6 in.
Length of feed	1 $\frac{1}{2}$ ft.	4 ft.	6 to 10 ft.	10 to 15 ft.	15 ft.	20 ft.	20 to 30 ft.
Usual depth of hole drilled	1 in.	1 to 16 in.	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.	2 in.	2 $\frac{1}{4}$ in.
Usual size of bottom of hole		50 ft.	60 ft.	70 ft.	70 ft.	70 ft.	70 ft.
Depth drilled in ten hours, Little Giant			80 ft.	90 ft.	1 in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{2}$ in.
Depth drilled in ten hours, Slugger			3 $\frac{1}{2}$ in.	1 in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{2}$ in.
Diameter of steel	3 $\frac{1}{2}$ in.	3 $\frac{1}{2}$ in.	1 in.	1 $\frac{1}{2}$ in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{4}$ in.	1 $\frac{1}{2}$ in.
Diameter of boiler to run by steam, Little Giant	3 H. P.	5 H. P.	7 H. P.	10 H. P.	10 H. P.	12 H. P.	15 H. P.
Size of boiler to run by steam, Slugger			7 H. P.	10 H. P.	10 H. P.	12 H. P.	15 H. P.
Size of steam pipe, 150 feet long	3 $\frac{1}{2}$ in.	1 in.	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.	2 in.	2 in.
Weight of machine, without mounting	100 lbs.	150 lbs.	200 lbs.	255 lbs.	300 lbs.	400 lbs.	560 lbs.
Weight of tripod, without weights	70 lbs.	70 lbs.	145 lbs.	175 lbs.	175 lbs.	382 lbs.	400 lbs.
Weight of set of weights, three to the set	108 lbs.	210 lbs.	288 lbs.	336 lbs.	336 lbs.	510 lbs.	510 lbs.
Weight of column, 6 feet high			305 lbs.	305 lbs.	305 lbs.	350 lbs.	
Weight of shaft bar, 8 feet long, with one arm			245 lbs.	245 lbs.	245 lbs.		
Weight of quarry bar			750 lbs.	750 lbs.			
Outside measurements of box for shipping drill alone	3 $\frac{1}{2}$ "x12 $\frac{1}{2}$ "x30 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "x12 $\frac{1}{2}$ "x10 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "x13 $\frac{1}{4}$ "x10 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x11"	4 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x13"	4 $\frac{1}{2}$ "x16 $\frac{1}{2}$ "x13"	4 $\frac{1}{2}$ "x16 $\frac{1}{2}$ "x13"
Outside measurements of box for shipping tripod	3 $\frac{1}{2}$ "x8 $\frac{1}{2}$ "x6"	3 $\frac{1}{2}$ "x8 $\frac{1}{2}$ "x6"	3 $\frac{1}{2}$ "x8 $\frac{1}{2}$ "x8"	3 $\frac{1}{2}$ "x10 $\frac{1}{2}$ "x10"	3 $\frac{1}{2}$ "x10 $\frac{1}{2}$ "x10"	4 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x14"	4 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x14"
Outside measurements of box for shipping quarry bar	2 $\frac{1}{2}$ "x12 $\frac{1}{2}$ "x2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "x12 $\frac{1}{2}$ "x2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x14"	2 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x14"	2 $\frac{1}{2}$ "x14 $\frac{1}{2}$ "x14"	2 $\frac{1}{2}$ "x16 $\frac{1}{2}$ "x16"	2 $\frac{1}{2}$ "x16 $\frac{1}{2}$ "x16"
Outside measurements of box for shipping six lengths of hose							

BLAKE'S IMPROVED ROCK AND ORE CRUSHER.

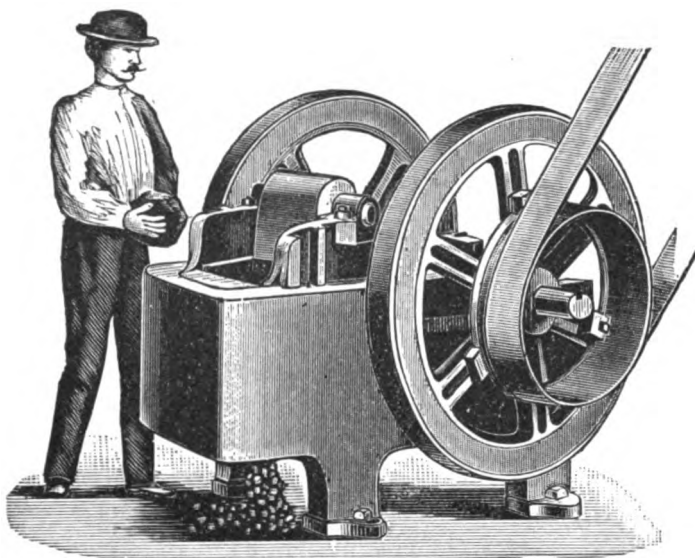


Plate 1312.

Perspective view of regular pattern. A machine well adapted for stationary rig.

Size or Receiving Cap.	Tons per hour to Macadam Size	Extreme Dimensions		Pulleys 6 Inch Face, Diam.
		Length	Width	
9x10	7 to 9	6	4 1/4	28
9x15	9 to 12	6	5	28
9x20	14 to 17	6	5 1/2	28
9x30	21 to 23	6 1/4	6 1/2	30
9x40	28 to 33	6 1/4	7 1/2	30
10x10	8 to 10	6 1/4	4 3/4	30
10x20	16 to 18	6 1/2	5 3/4	30
10x30	24 to 27	6 1/2	6 3/4	32
10x40	32 to 38	6 1/2	7 3/4	32
12x10	9 to 12	7	5	34
12x20	18 to 24	7	6	36
12x30	27 to 30	7	7	39
12x40	36 to 40	7	8	34

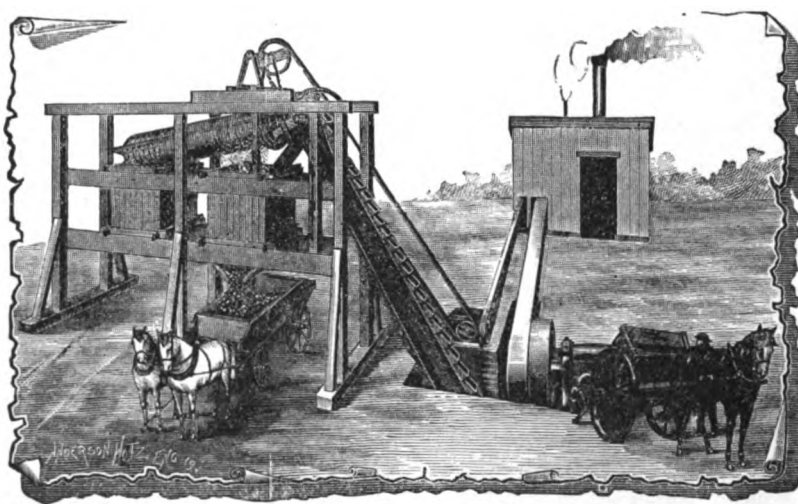


Plate 1313.

This cut shows plan of macadam plant consisting of crusher, elevator, screen, bin, etc. This plant is well adapted for road contractor's use, either in making concrete or macadam.

Size or Receiving Capacity	Weight of Breakers	Horse Power Required	Price Delivered on Cars
9 x 10	6,000	8	\$ 450 00
9 x 15	8,000	10	550 00
9 x 20	10,800	12	750 00
9 x 30	12,000	20	900 00
9 x 40	14,000	25	1,050 00
10 x 10	6,500	10	500 00
10 x 20	11,000	12	850 00
10 x 30	12,500	20	1,100 00
10 x 40	14,500	25	1,350 00
12 x 10	6,600	10	550 00
12 x 20	12,000	15	1,000 00
12 x 30	14,200	25	1,250 00
12 x 40	16,000	30	1,500 00

THE WHITING FOUNDRY CUPOLA.

THE WHITING CUPOLA—CUT B.
(Sectional View of Body.)

THE WHITING PATENT CUPOLA—CUT A.

(Body Section with Platform.)

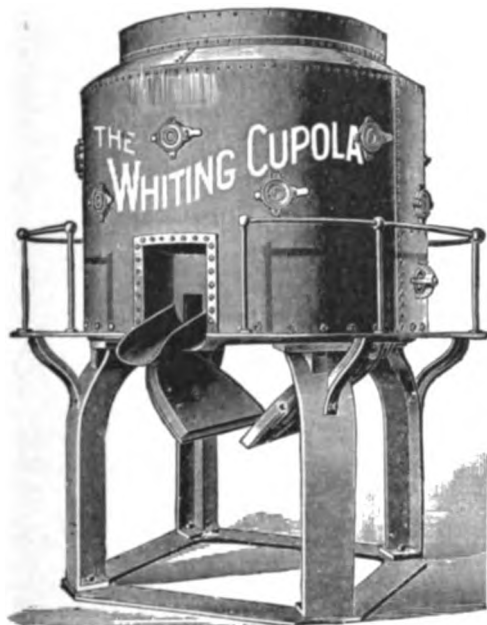


Plate 1314.

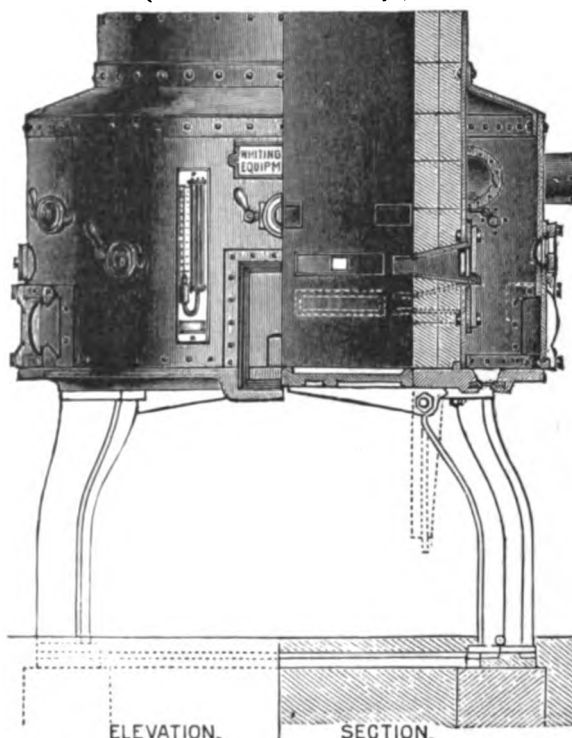


Plate 1315.

Cut A represents the general external appearance of the Whiting Patent Cupola without stack and with railing attached. Cut B shows the internal arrangement of the cupola as well as the various appliances for controlling and registering the blast, cleaning out the air chamber, etc. The universal satisfaction given by the Whiting Cupola is largely due to the patented arrangement and construction of the tuyere system, which is so designed as to distribute the blast most efficiently, carrying it to those portions of the Cupola where it will do the most good, under a reduced pressure, and through an increased area. There are two rows of tuyeres. The lower ones are arranged to form an annular air inlet, distributing the blast continuously around the entire circumference of the Cupola. This system of tuyeres is also arranged to be adjusted vertically. This provides for adjustment to the class of work, kind of fuel, and changes in the inside diameter of the Cupola. These tuyeres are flaring in shape and admit the blast through a small area which is expanded into a large horizontal opening on the inside of the Cupola, thus permitting the air to reach the fuel through an area nearly double that through which it enters the tuyeres—admitting the same volume of blast but softening its force. There is an upper row of tuyeres of similar construction to supply sufficient air to utilize to the fullest extent the escaping carbon gas. These tuyeres are of great service in melting and in large heats. For small heats they may be closed by means of our improved tuyere dampers.

This Cupola is substantially made throughout, and will give good, long service. It is much heavier than the Cupola usually built. It is designed from an engineering standpoint, and there is no waste material whatever, the portions which require the heaviest loads being proportioned accordingly, the bottom plate especially being made very heavy. The supporting columns are curved in order to allow the bottom door to drop vertically, and at the same time bring the support directly under the weight of the iron and lining, thus preventing the bottom plate from cracking. The shell is made extra heavy, especially that portion of it which is designed to support and enclose the charge; this heavy construction is more expensive at first, but it is found much more durable and safe in the end, decreasing the risk and the amount of repairs constantly needed on a lighter constructed article. The top of the air chamber is made of flange steel; this allows it to be properly caulked and made air-tight, and also decreases the liability of breakage in shipment. The flange steel top contributes materially to the strength of the shell.

Number of Cupola	Capacity Per Hour in Tons	Diameter of Shell	Diameter Inside of Lining	Diameter of Air Chamber	Lining to be used for Rated Capacity Thickness Below	Thickness of Steel Plates of Shell	
						In Body	In Stack
No. 0	$\frac{1}{4}$ to $\frac{1}{2}$ ton	27 inch	18 inch	.....	4 $\frac{1}{2}$ inch	$\frac{1}{8}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 1	$\frac{1}{2}$ to 1 ton	32 inch	23 inch	44 inch	4 $\frac{1}{2}$ inch	$\frac{1}{8}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 2	1 to 2 ton	36 inch	27 inch	50 inch	4 $\frac{1}{2}$ inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 2 $\frac{1}{2}$	1 to 2 or 3 to 5 ton	41 inch	27 to 32 inch	57 inch	7 or 4 $\frac{1}{2}$ inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 3	3 to 5 ton	46 inch	32 inch	62 inch	7 inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 3 $\frac{1}{2}$	5 to 6 ton	51 inch	37 inch	68 inch	7 inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 4	6 to 7 ton	56 inch	42 inch	72 inch	7 inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 5	7 to 9 ton	63 inch	45 inch	81 inch	9 inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 6	9 to 10 ton	66 inch	48 inch	87 inch	9 inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 7	10 to 12 ton	72 inch	54 inch	94 inch	9 inch	$\frac{1}{4}$	$\frac{1}{8}$ and $\frac{1}{8}$
No. 8	12 to 14 ton	78 inch	60 inch	102 inch	9 inch	$\frac{3}{8}$	$\frac{1}{4}$ and $\frac{1}{8}$
No. 9	14 to 18 ton	84 inch	66 inch	108 inch	9 inch	$\frac{3}{8}$	$\frac{1}{4}$ and $\frac{1}{8}$
No. 10	18 to 24 ton	96 inch	78 inch	119 inch	9 inch	$\frac{3}{8}$	$\frac{1}{4}$ and $\frac{1}{8}$
No. 11	24 to 28 ton	102 inch	84 inch	128 inch	9 to 12 inch	$\frac{3}{8}$	$\frac{1}{4}$ and $\frac{1}{8}$

GARDNER SPRING GOVERNOR.

CLASS A.

SPRING, WITH SPEEDER, HAND LEVER
AND AUTOMATIC STOP.

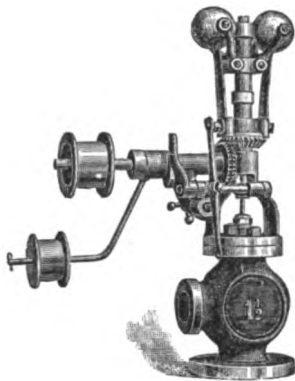


Plate 1316.

CLASS B.

SPRING, WITH SPEEDER AND
HAND LEVER.

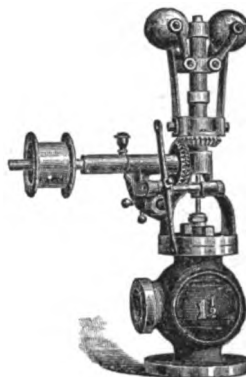


Plate 1317.

Our Spring Governors were designed especially for high-speed stationary and portable engines. They are very quick and sensitive in action. In construction they are fully up to the best modern practice in every particular, and are made in sizes from $\frac{1}{2}$ to 7 inches inclusive.

CLASS A AND B SPRING GOVERNORS.

Size of Governor (being Inside Diameter of Steam Pipe.)

Size of Governor	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$ in.
Class B, Plain	\$16 00	18 00	20 00	22 00	25 00	30 00	40 00
Class B, Finished	18 00	20 00	22 00	25 00	29 00	34 00	45 00
Class A, Plain	.....	.....	\$23 00	25 50	29 50	36 00	48 00
Class A, Finished	.....	.....	25 00	28 50	33 50	40 00	53 00
Size of Governor	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7 in.
Class B, Plain	\$50 00	60 00	71 00	83 00	94 00	122 00	150 00
Class B, Finished	58 00	69 00	81 00	94 00	106 00	136 00	166 00
Class A, Plain	59 00	71 00	83 00	96 00	109 00	140 00	170 00
Class A, Finished	67 00	80 00	93 00	107 00	121 00	154 00	186 00

In all orders for Governors, be particular to state if Plain or Finished is wanted; the Class, A or B, and style of Valve Chamber, as per cuts lettered below.



Plate 1318.

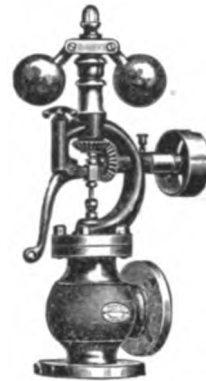


Plate 1319.



Plate 1320.

In ordering Repairs, always send the Serial Number of the Governor, as well as the Inside Diameter of the Steam Pipe.

GARDNER COMPENSATION GOVERNOR.**CLASS A.****STANDARD WITH AUTOMATIC STOP.****Plate 1321.****CLASS B.****STANDARD WITHOUT AUTOMATIC STOP.****Plate 1322.**

Class A represents our Standard Automatic Governor, arranged so as to close the valve in case of accident to the belt. The automatic device is simple in its construction and certain in its action, and requires no setting or attention. If the belt breaks or slips off the pulley, the support of the fulcrum is forced back so as to allow the fulcrum to drop, and thus instantly closes the valve.

Class B shows our Standard Governor without the automatic stop. It is made in all sizes from $\frac{3}{4}$ to 12 inches inclusive, and furnished with speeder and Sawyer's lever.

CLASS A AND B STANDARD GOVERNORS.

Size of Governor (being inside Diameter Steam Pipe).

Size of Governor	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$ in.
Class B, Plain	\$18 00	20 00	22 00	25 00	30 00	40 00	50 00	60 00
Class B, Finished	20 00	22 00	25 00	29 00	34 00	45 00	58 00	69 00
Class A, Plain . . . . .	.....	.....	.....	29 50	36 00	48 00	59 00	71 00
Class A, Finished . . . . .	.....	.....	.....	33 50	40 00	53 00	67 00	80 00
Size of Governor	4	$4\frac{1}{2}$	5	6	7	8	9	10 in.
Class B, Plain	\$71 00	83 00	94 00	122 00	150 00	185 00	215 00	240 00
Class B, Finished	81 00	94 00	106 00	136 00	166 00	202 00	235 00	260 00
Class A, Plain	83 00	96 00	109 00	140 00	170 00	210 00	241 00	270 00
Class A, Finished	93 00	107 00	121 00	154 00	186 00	227 00	261 00	290 00

In all orders for Governors, be particular to state if plain or finished is wanted; the Class A or B; and style of valve chamber, as per cut lettered below.

E.**Plate 1323.****F.****Plate 1324.****G.****Plate 1325.**

In ordering repairs always send the serial number of the Governor as well as the inside diameter of steam Pipe.

THE SENSITIVE GOVERNOR.

CLASS A.

WITH SPEEDER, SAWYER'S LEVER AND
AUTOMATIC STOP.

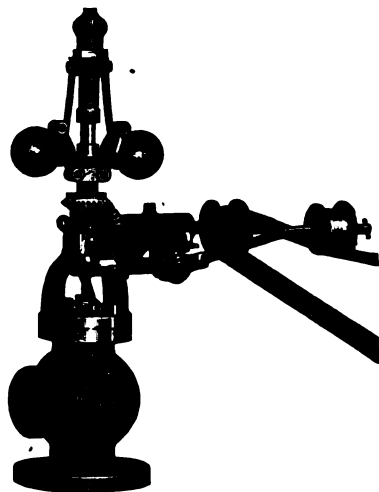


Plate 1326.

CLASS B.

WITH SPEEDER AND SAWYER'S LEVER.

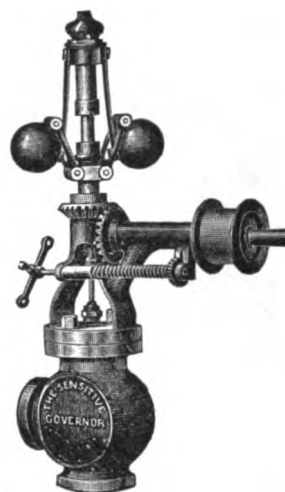


Plate 1327.

Sensitive, quick-acting and durable. Will govern as closely as most automatic engines. Is elegant in design and unequalled in workmanship and finish.

This Governor is presented to the attention of steam users, and is claimed to be what the name implies—a Sensitive Governor. It retains all the excellent points demonstrated by an experience of a quarter of a century, with new and valuable improvements added for preventing friction, rendering the Governor extremely sensitive to changes of speed, instantly varying the position of the valve to give proper steam opening, and quickly controlling the engine for such relative speed.

Each Governor is provided with speed regulator and Sawyer's lever.

We furnish, when desired, these Governors, with automatic stop motion. So that in case the belt should break, the idler pulley drops, closing the valve and effectually stopping the engine.

Size of Governor (being inside diameter of Steam Pipe).

Size of Governor	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3 in.
Plain	\$16 00	18 00	20 00	22 00	25 00	30 00	40 00	50 00
Finished	18 00	20 00	22 00	25 00	29 00	34 00	45 00	58 00
Automatic Stop, extra . . . . .	.....	.....	3 00	3 50	4 50	6 00	8 00	9 00
Size of Governor	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8 in.	
Plain	\$60 00	71 00	83 00	94 00	122 00	150 00	185 00	
Finished	69 00	81 00	94 00	106 00	136 00	168 00	202 00	
Automatic Stop, extra	11 00	12 00	13 00	15 00	18 00	20 00	25 00	

In ordering, be particular to state if plain or finished is wanted, the class whether A or B, also the style of base, whether E, F or G, as shown in cuts below.

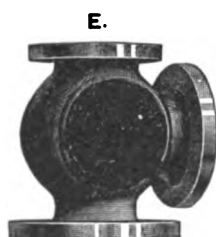


Plate 1328.



Plate 1329.



Plate 1330.

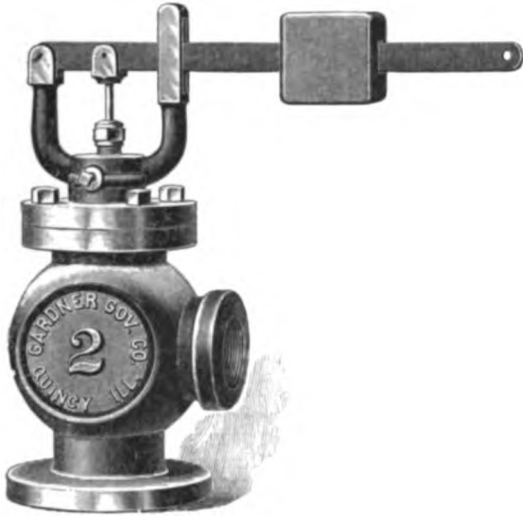


Plate 1331.

THE GARDNER BALANCED LEVER PUMP VALVE

The cut represents the Gardner Balanced Lever Valve, which is a useful device to control Steam Pumps in tank service by placing the Balanced Valve in the steam supply pipe to Pump, and connecting the Lever by a chain or cable to a float placed in the tank. It will also control the supply of water into tanks, being connected in the same manner with a float as in connecting steam. It may be used as a throttle or Sawyers' Valve and in many other places to good advantage. The Valve Chamber is that used by the Gardner Governor Co. in their Governors, and the Valves are made of Genuine Phosphor Bronze, and piston or seating Valves are furnished, as may be desired. The Lever has a swivel that may be set at any angle. Valve chambers as per cuts E, F, G, H, I, furnished without extra charge. The workmanship and material are of the best, and satisfaction is guaranteed to the purchaser.

$\frac{1}{2}$ inch	.....	\$ 5 50	3 inch	.....	\$ 25 00
$\frac{3}{4}$ inch	.....	6 50	$3\frac{1}{2}$ inch	.....	35 00
1 inch	.....	8 00	4 inch	.....	45 00
$1\frac{1}{4}$ inch	.....	9 00	5 inch	.....	65 00
$1\frac{1}{2}$ inch	.....	10 50	6 inch	.....	90 00
2 inch	.....	14 00	7 inch	.....	110 00
$2\frac{1}{2}$ inch	.....	20 00	8 inch	.....	140 00

GARDNER STEAM PUMP GOVERNOR OR REGULATOR.

The accompanying cut illustrates the new Gardner Steam Pump Governor or Regulator. It is an invaluable device for safety and economy, as it may be set at any desired pressure, which it will maintain with but slight variation, and as it cannot exceed the pressure at which it is set it prevents the danger of bursting pipes, mains and hose arising from violent shocks and jars. It controls automatically the operation of steam pumps on compression and gravity tank systems, such as are generally used for elevator service. They are largely used on Sprinkler Systems, Fire Pumps, Water Works, Elevators, and many other places where uniform pressure is desirable and where excessive pressure is injurious. They save unnecessary wear and tear of costly machinery, and are economical in the consumption of fuel. They are made of the best material, and the Valves and Seats are of Phosphor Bronze, making them much more lasting and durable than the ordinary Regulator on the market. They are warranted to do all we claim for them, and will be furnished on 30 days' trial to responsible parties. When ordering, give size of steam pipe, and also maximum and minimum steam and water pressure at ordinary and special duty.

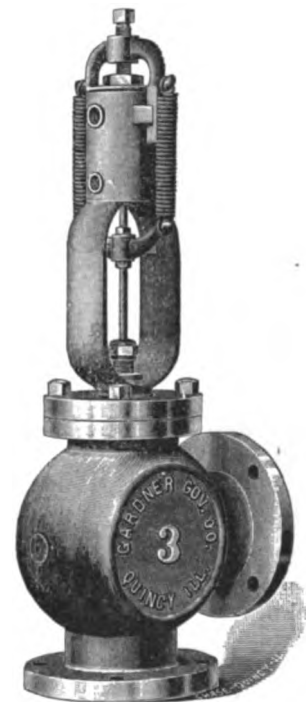


Plate 1332.

SCREWED.			FLANGED.		
$\frac{1}{2}$ inch	.....	\$25 00	2 inch	.....	\$ 50 00
$\frac{3}{4}$ inch	.....	27 50	$2\frac{1}{2}$ inch	.....	60 00
1 inch	.....	30 00	3 inch	.....	75 00
$1\frac{1}{4}$ inch	.....	35 00	$3\frac{1}{2}$ inch	.....	87 50
$1\frac{1}{2}$ inch	.....	42 50	4 inch	.....	100 00
2 inch	.....	50 00	5 inch	.....	125 00
$2\frac{1}{2}$ inch	.....	58 00	6 inch	.....	150 00

A liberal discount will be allowed from the list above.

AUSTIN PATENT SEPARATOR.

A.
VERTICAL SEPARATOR.

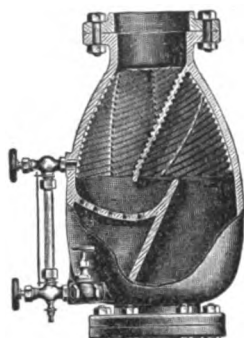


Plate 1332.

B.
HORIZONTAL SEPARATOR.

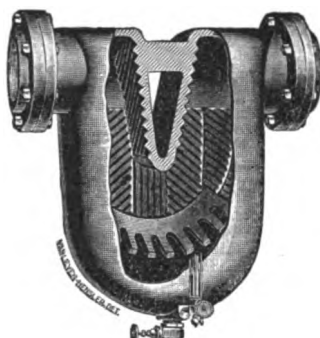


Plate 1333.

C.
STEEL SEPARATOR.

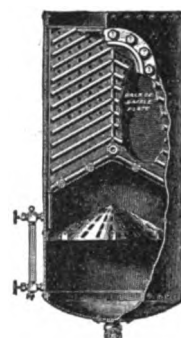


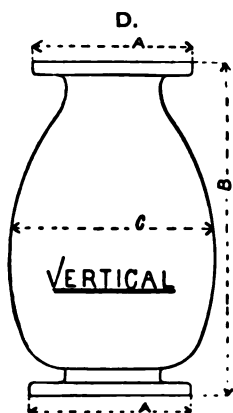
Plate 1334.

Invaluable for eliminating condensation from live steam, and removing impurities of whatever nature from exhaust steam.

HORIZONTAL AND VERTICAL MACHINES.

Size . .	1½	2	2½	3	3½	4	4½	5	6	7	8	10 in.
Price .	\$30 00	40 00	45 00	50 00	60 00	70 00	75 00	80 00	110 00	125 00	160 00	220 00

Include connecting flanges, water gauge, nipple and straightway valve.



VERTICAL MACHINE.

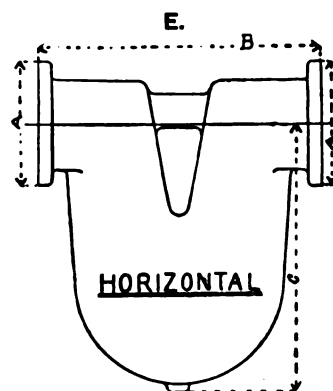
Inches.

Size .	1½	2	2½	3	3½	4	4½	5	6	7	8	10
A . .	6½	6½	6½	7½	9	9	10	10	11	12½	13½	16
B . .	12½	12½	12½	15	18	18	22	22	25	28	31	36
C . .	8	8	8	9	11	11	13	13	15	17	19	23

HORIZONTAL MACHINE.

Inches.

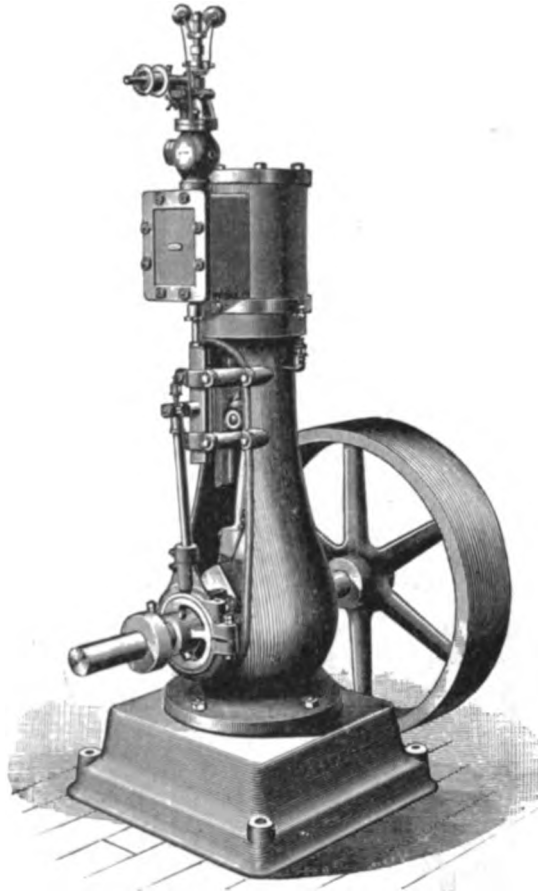
Size .	1½	2	2½	3	3½	4
A . .	Screwed Ends	Screwed Ends	6½	7½	8	9
B . .	9	9	13	15	16	18
C . .	9	9	12	13	14	15
Size .	4½	5	6	7	8	10
A . .	9½	10	11	12½	13½	16
B . .	19	20	24	27	30	31
C . .	17	19	22	25	29	36



Guaranteed to separate oil from exhaust of any type of engine. Write for discounts. Results guaranteed. Sold on merit.

In ordering, state if horizontal or vertical is wanted, and if for live or exhaust steam.

We furnish Separators of flange steel shells in sizes from 12 to 20 inches. Write for special prices.

VERTICAL CENTER CRANK ENGINES.**Plate 1335.**

The engraving represents Vertical Center Crank Engines, which are thoroughly well made throughout of the best material. The Cranks are large and made of solid forgings, all Bearings are of the best brass and Babbitt, the Pistons fitted with steam packing, the Cylinders surrounded with hot air jackets, and all parts are made in duplicate and interchangeable. All Engines are thoroughly tested with steam before leaving the works.

	Cylinder, Inches	Horse Power	Speed per Minute	Fly Wheel, Inches	Steam Pipe, Inches	Exhaust Pipe, Inches	Weight, Pounds	Price, Complete, as shown
No. 199	3 x 4	2½	250	16 x 4	¾	1	250	\$ 95 00
No. 200	3½ x 5	3½	250	20 x 4	¾	1	450	105 00
No. 201	4 x 5	4½	250	20 x 5	1	1¼	700	120 00
No. 202	5 x 5	6	250	24 x 5	1¼	1½	800	135 00
No. 203	6 x 6	8	200	24 x 5	1¼	1½	1,000	155 00
No. 204	7 x 7	10	190	30 x 6	1½	2	1,600	190 00
No. 205	8 x 8	15	190	36 x 8	1½	2½	1,900	225 00
No. 206	9 x 9	20	160	40 x 8½	2	3	2,500	265 00
No. 207	10 x 10	25	160	48 x 10½	2½	3	3,200	320 00
No. 207B	12 x 12	40	150	54 x 12½	2½	3½	4,500	450 00

This Engine with Link Motion, or combined with Vertical Boiler, if wanted.

VERTICAL AUTOMATIC ENGINES.

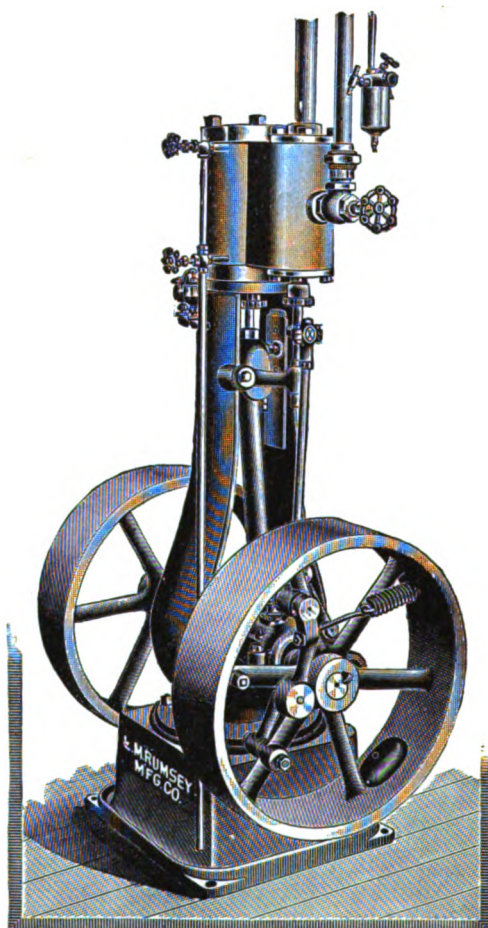


Plate 1336.

No. of Size	H. P.	Revolutions	Cylinder		Pulleys		Pipes		Price
			Diam.	Stroke	Gov. Pulley	Belt Pulley	Steam	Exhaust	
400	2	450	3	3½	16 x 4½	10 x 4½	¾	1	\$ 85 00
401	3	450	3½	3½	16 x 4½	10 x 4½	¾	1	95 00
402	4	375	4	4½	20 x 5½	10 x 6½	1	1¼	105 00
403	5	375	4½	4½	20 x 5½	10 x 6½	1	1¼	115 00
404	6	300	5	6	24 x 5½	12 x 7½	1¼	1½	130 00
405	7	300	5½	6	24 x 5½	12 x 7½	1¼	1½	145 00
406	8	275	5½	7	26 x 6½	16 x 8½	1½	2	165 00
407	10	275	6	7	26 x 6½	16 x 8½	1½	2	190 00
408	12	275	6	8	30 x 7½	16 x 10½	1½	2	220 00
409	16	275	7	8	30 x 7½	16 x 10½	2	2½	260 00

The power is based on 80 pounds initial steam pressure cutting off at one-fourth stroke. All Engines are thoroughly tested before being shipped, and may be run at speeds ranging 20 per cent either way from above list. Unless otherwise specified they will be adjusted to run at listed speed. Pulleys will be furnished, as per list, when not otherwise ordered. Changes of Pulleys charged for at cost. We furnish with each Engine a full set of Oil Cups, Wrench, Throttle Valve and Sight Feed Lubricator. This Engine combined with Upright Boiler, if wanted.

VERTICAL ENGINES.**SIDE CRANK.****Plate 1337.**

Built in sizes from four to thirty-five horse power.

We present this style of Engine as a very desirable form for general purposes where small powers are required. They are very strong, heavy, well proportioned and will stand hard work.

A critical steam test of every Engine is made before it leaves the factory, and the necessary adjustments carefully made, so that the Engine is ready to run when placed in position and given steam. We furnish eight sizes of this Engine, as below:

Number of Size	270	271	272	273	274	275	276	277
Horse Power as usually rated . .	4	6	8	10	15	20	25	35
Size of Cylinder, inches	4 x 4	5 x 5	6 x 6	7 x 7	8 x 8	9 x 9	10 x 10	12 x 12
Revolutions per minute	250	250	200	190	180	160	160	160
Size of Steam Pipe, inches . . .	3/4	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Diameter of Shaft, inches	1 1/8	1 1/4	1 1/2	2 5/8	2 1/2	2 3/4	3 1/4	3 3/4
Diameter of Fly Wheel, inches . .	16	20	24	32	36	42	44	48
Face of Fly Wheel, inches	4	5	6	7	8	9	10	12
Height from Floor to Center of Shaft, inches	10	12	14	18	20	24	26	28
Height to top of Cylinder	3 ft.	3 ft. 7 in.	4 ft. 5 in.	5 ft. 1 in.	5 ft. 8 in.	6 ft. 6 in.	7 ft.	7 ft. 8 in.
Floor Space Occupied, inches . .	15 x 28	18 x 36	22 x 40	25 x 46	28 x 50	30 x 56	36 x 62	40 x 70
Weight of Engine, pounds	350	600	900	1,300	1,800	2,400	3,200	4,400
With Governor and Oil Cups . . .	\$105 00	125 00	155 00	195 00	245 00	310 00	390 00	500 00

AUTOMATIC ENGINES.

SIDE CRANK.

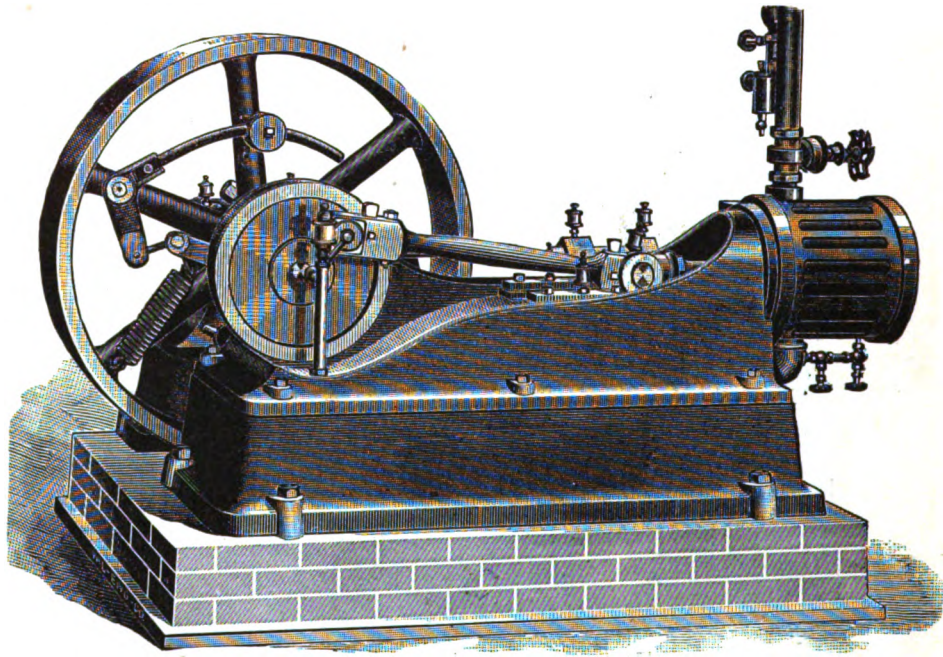


Plate 1338.

These Engines are of new design, strong and well proportioned throughout; thoroughly well made and self-contained. The cylinders are jacketed, the ports equal in length to the diameter of the cylinder, and so arranged as to insure perfect drainage.

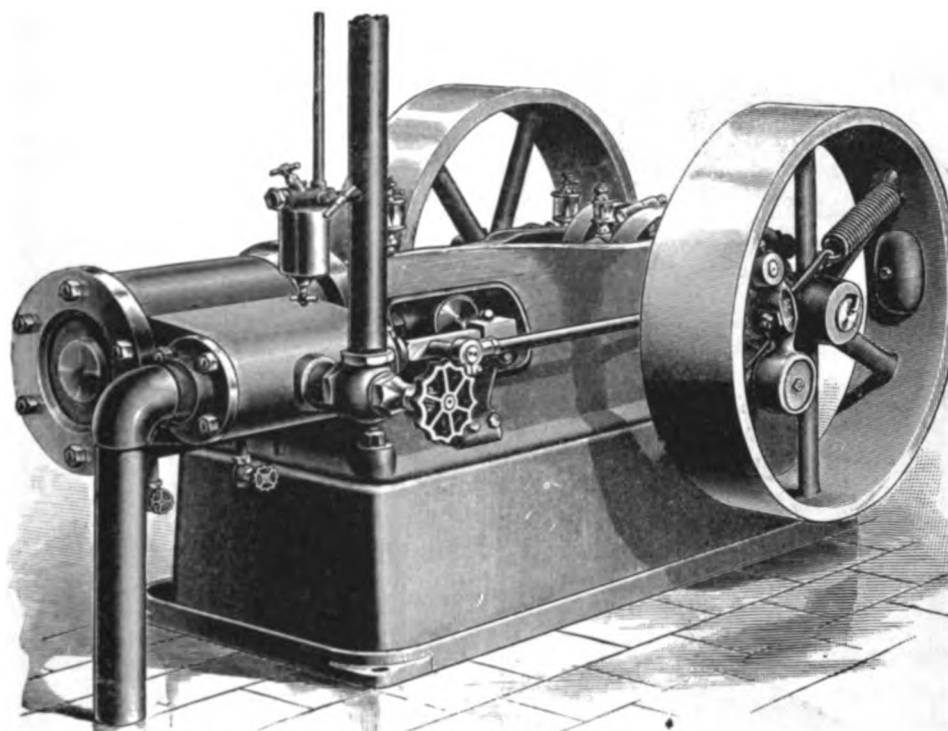
The unusually large pipes give ample supply of steam, and the full disc crank so perfectly balances the Engine as to admit of high speed with safety, while the Engine is governed by an improved device contained within the fly wheel, which is thoroughly automatic in its action, can be easily adjusted, and runs smoothly and quietly, regulating evenly under varying conditions of steam pressure and load.

This Engine has an improved balance slide valve, simple in construction, which moves easily, is self-adjusting to natural wear, perfect seating, remaining perfectly steam tight, and is, in every way, reliable and durable.

Size	Size of Cylinder, Inches	Horse Power	Rev. per Minute	Fly Wheel, Inches	Belt Pulley, Inches	Diameter Steam Pipe, in.	Diameter Exhaust Pipe, in.	Shipping Weight, Lbs.	Price
No. 60	4½ x 6	8	380	20x5½	14x 6½	1	1¼	675	\$160 00
No. 61	5 x 7½	10	320	30x6¾	16x 7½	1¼	1½	1,000	200 00
No. 62	6 x 7½	12	300	30x6¾	18x 8½	1½	2	1,100	225 00
No. 63	7½ x 8	18	280	35x7½	20x10½	2	2½	1,700	310 00
No. 64	8 x 10	25	260	40x9¾	20x12	2½	3	2,400	400 00
No. 65	9¼ x 10	35	260	40x9¾	24x12	2½	3	2,500	475 00

Power is based on 80 pounds initial pressure, cut off at ¼ stroke.

The Engine is supplied with oilers, sight feed lubricator and drain cocks complete.

HORIZONTAL CENTER CRANK AUTOMATIC ENGINES.**Plate 1330.**

These Engines are constructed in a thorough and workmanlike manner, of the best materials, and all parts made to Standard Gauges and Templates, so that repairs can be readily obtained, when wanted.

All Engines are tested under steam, and with full load, and will regulate within 2 per cent. Powers are based on 80 pounds steam pressure at the Cylinder—cutting off at $\frac{1}{4}$ stroke.

No. of Size	Horse Power	Cylinder Diam. Stroke Inches	Revolu- tions per Minute	Size of Govern- nor Wheels	Size of Belt Pulleys	Steam Pipe, Inches	Exhaust Pipe, Inches	Floor Space, Inches	Weight about, Lbs.	With Sub- Base	Without Sub- Base
50	8	5½ x 7	275	26 x 6½	16 x 8½	1½	2	20 x 46	1,100 . .	\$180 00	\$170 00
51	10	6 x 7	275	26 x 6½	16 x 8½	1½	2	20 x 46	1,200 . .	210 00	200 00
52	12	6 x 8	275	30 x 7½	16 x 10½	1½	2	23 x 53	1,400 . .	240 00	225 00
53	16	7 x 8	275	30 x 7½	16 x 10½	2	2½	23 x 53	1,500 . .	285 00	270 00

Furnished complete with Lubricator, Oil Cups, Throttle Valve, Pulleys and Wrenches, and with or without Cast Iron Sub-Base, as desired.

Speed may be increased 15 to 20 per cent above that given in table—giving corresponding increase of power.

FRICK COMPANY'S ECLIPSE HIGH SPEED AUTOMATIC STEAM ENGINES.

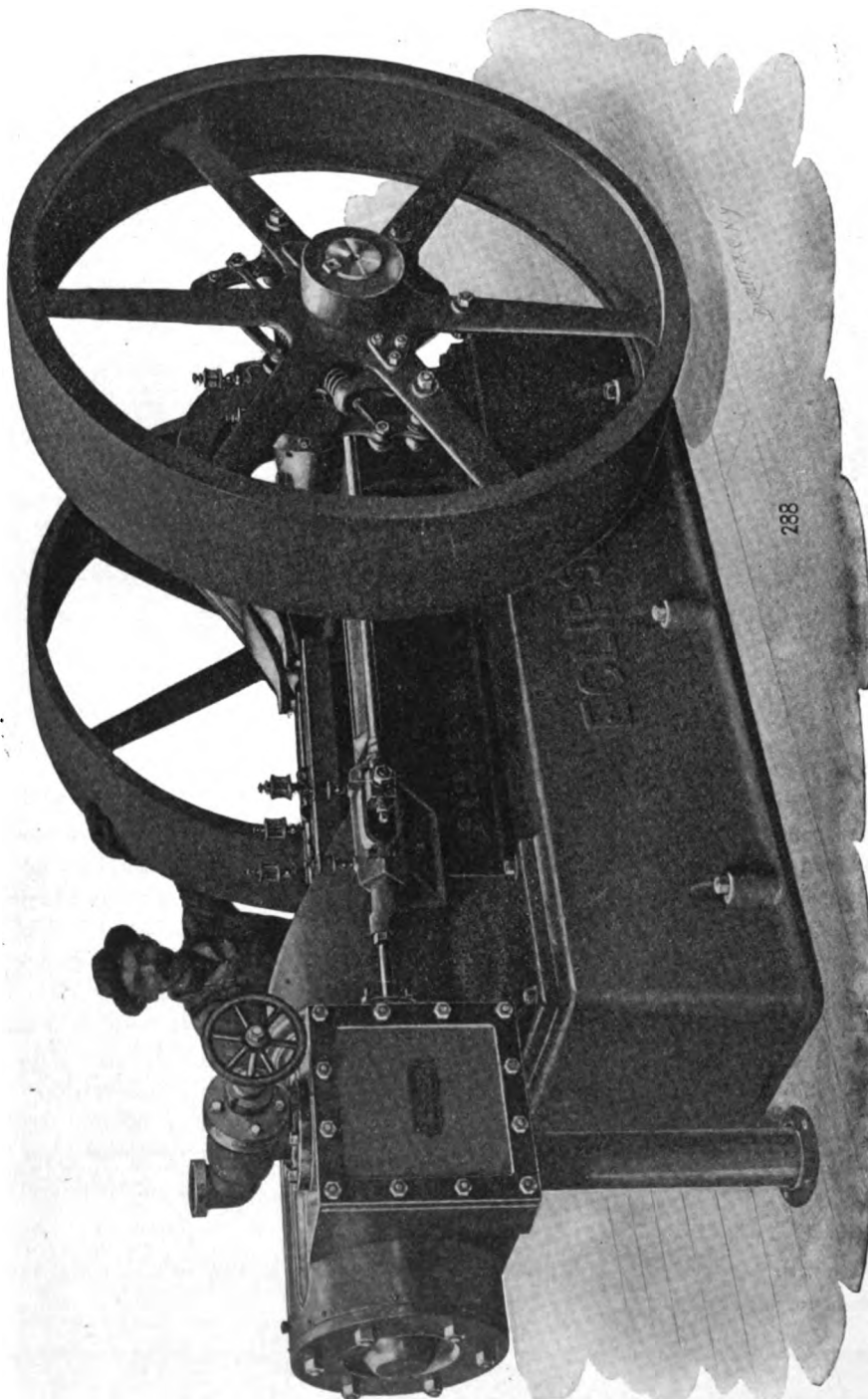


Plate 1340.

We furnish our High Speed Automatic, either of the Single Valve Crank Shaft Regulator Style, Simple Expansion Cylinder, or Tandem Compound, or with Extended Sub-Base to receive direct-connected electric generators or dynamos, the armature being mounted directly upon the crank shaft, either overhanging or with outer bearing, as may be wanted. It is made at present in ten sizes, ranging from 5 to 14 inch cylinders. For dimensions, etc., see next page.

FRICK'S ECLIPSE HIGH SPEED AUTOMATIC ENGINES.

TABLE OF DIMENSIONS AND HORSE POWER OF SIMPLE NON-CONDENSING ECLIPSE HIGH SPEED AUTOMATIC STEAM ENGINES.

REGULAR PATTERN, MOUNTED ON HIGH SUB-BASE.

Size of Engine		Revolutions per minute	Piston travel per minute	Horse Power—Non-Condensing Engines Steam cut off at one-quarter Stroke			FLY WHEELS				Belt Speed, Minimum	Belt Speed, Maximum	Weight of Engine, complete	FLOOR SPACE		Steam Pipe, Inches	Exhaust Pipe, Inches
Diameter, Inches	Stroke, Inches			80 pounds Boiler Pressure	90 pounds Boiler Pressure	100 pounds Boiler Pressure	Fly Wheel, Diameter, Inches (Two)	Face, Inches	Driving Pulley, Diameter, Inches (To order only)	Face, Inches				Length.	Width.		
				40 pounds M. E. P.	44 pounds M. E. P.	53 pounds M. E. P.											
				Revs.	Revs.	Revs.											
5	10	337	561	14	15½	17½	42	8	28	8	1649	2470	3600	7'	4'	1½	2
6	10	337	561	19	22	25½	42	8	28	8	1649	2470	3800	7'	4'	2	2½
7	12	315	630	29	34	34½	48	8	36	8	1979	2967	4200	9'	4' 7"	2½	3
8	12	315	630	38	44½	50½	48	8	36	8	1979	2967	4600	9'	4' 7"	2½	3½
9	14	300	700	54	62½	71	60	12	42	8	2198	3297	7000	10' 4"	5' 10"	2½	3½
10	14	300	700	66	77½	88	60	12	42	8	2198	3297	7600	10' 4"	5' 10"	2½	3½
11	16	270	720	82	96	110	72	14	48	14	2260	3391	9400	11' 6"	6'	3	4
12	16	270	720	98	114	130	72	14	48	14	2260	3391	10000	11' 6"	6'	3	4
13	18	240	720	115	134½	153	72	14	72	14	3014	4521	12300	11' 9"	6' 3"	3½	4½
14	18	240	720	134	156	177½	72	14	72	14	3014	4521	13000	11' 9"	6' 3"	3½	4½

Mean effective Pressure

If Condensing, Power gained by Condensing 25 per cent, 21½ per cent, 19 per cent. To obtain Horse Power for Engines when made condensing, add percentage given to power shown by table

NOTE.—Two large Wheels are furnished, except to special order.

Engines are carefully adjusted and tested for regulation and smooth running before shipment, with high cast-iron base which allows the fly wheel to clear the floor.

We can supply with two small fly wheels, or one large fly wheel and driving pulley as named in table. Where small wheels are used, the weight of same is made ample for the requirements of good regulation. Larger sizes to special order.

HORSE POWER OF COMPOUND HIGH SPEED AUTOMATIC STEAM ENGINES.

Size of Engine			Revolutions per Minute	Speed of Piston per Minute	H. P. NON-CONDENSING ENGINES At Revolutions given. Steam Pressures by Gauge					H. P. CONDENSING ENGINES At Revolutions given. Steam Pressures by Gauge				
High	Low	Stroke			90	100	110	120	130	120	130	140	150	160
5	9	10	337	561	27	28	29	29	30	36	38	39	40	41
5	10	10			33	34	35	35	37	45	47	48	49	51
6	10	10			35	36	37	37	39	47	49	50	51	52
6	11	10	337	561	40	41	43	44	45	55	56	58	60	62
6	12	10			44	45	47	48	50	61	63	65	67	70
7	12	12			54	55	58	58	60	73	75	78	80	83
7	13	12	315	630	63	65	68	69	71	86	89	92	94	98
7	14	12			73	76	79	80	82	100	103	106	109	114
8	14	12			73	76	79	80	82	100	103	106	109	114
8	15	12	315	630	84	87	90	92	95	115	119	122	126	131
8	16	12			96	99	108	105	108	131	135	139	143	149
9	16	14			107	110	114	116	118	145	150	154	159	165
9	17	14	300	700	120	124	129	131	135	163	169	174	179	186
9	18	14			135	140	145	147	152	184	190	196	201	209
10	17	14			120	124	129	131	135	163	169	174	179	186
10	18	14	300	700	135	140	145	147	152	184	190	196	201	209
10	19	14			151	156	162	164	169	205	212	218	224	233
10	20	14			167	173	180	183	188	228	235	242	249	259
11	19	16			155	160	166	169	174	211	218	224	231	240
11	20	16			172	178	185	188	193	234	242	249	256	266
11	21	16	270	720	189	196	203	206	213	257	265	274	282	293
11	22	16			208	215	223	227	233	283	292	301	309	322
12	21	16			189	196	203	206	213	257	265	274	282	293
12	22	16			208	215	223	227	233	283	292	301	309	322
12	23	16	270	720	227	235	244	248	255	309	319	329	338	351
12	24	16			247	256	265	270	278	336	348	358	368	383
13	23	18			206	215	223	227	233	283	292	301	309	322
13	24	18			227	235	244	248	255	309	319	329	338	351
13	25	18	240	720	247	256	265	270	278	336	348	358	368	383
13	26	18			269	277	288	293	301	365	377	388	399	415
13	27	18			291	300	312	317	326	395	408	420	432	449
14	24	18			247	256	265	270	278	336	348	358	368	383
14	25	18	240	720	269	277	288	293	301	365	377	388	399	415
14	26	18			291	300	312	317	326	395	408	420	432	449
14	27	18			313	323	336	341	351	426	440	453	466	484
14	28	18			337	348	361	367	378	458	473	487	501	521

For cut, see preceding page.

BALL SINGLE CYLINDER ENGINE,
FOR ELECTRIC LIGHTING, ELECTRIC RAILWAY OR GENERAL
MANUFACTURING PURPOSES.

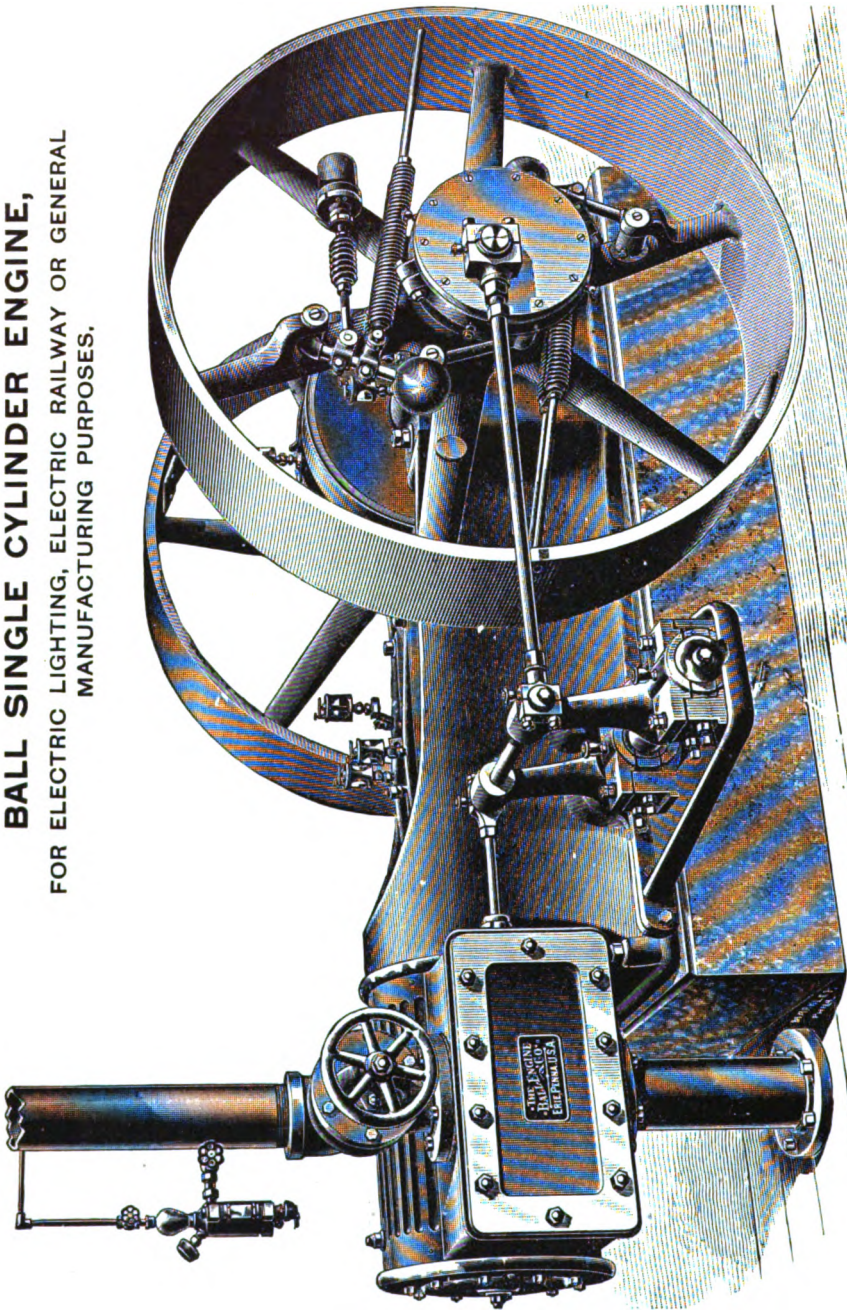
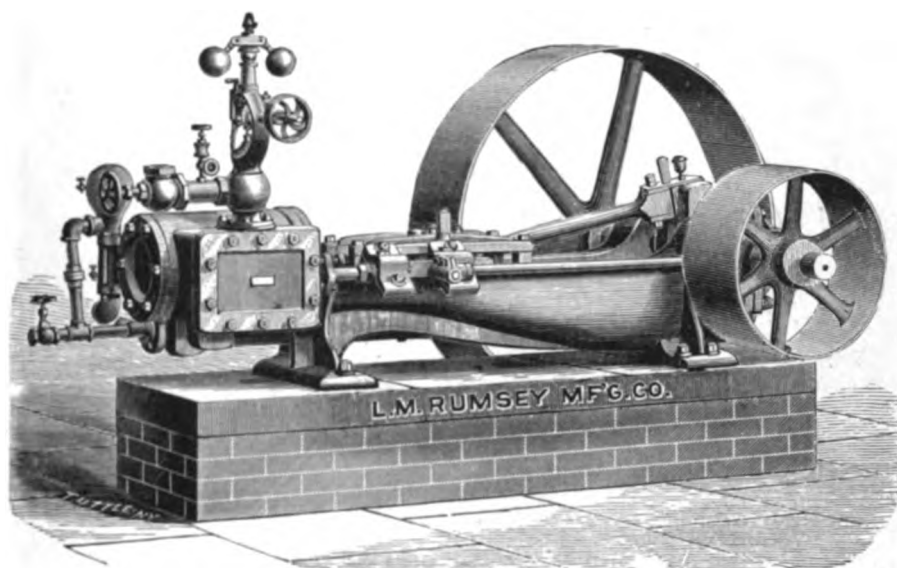


Plate 1341.

We furnish complete set of Fittings, consisting of Cylinder Lubricator, Sight Feed Oil Cups, Oil Shields, Wiper Cups, Wrenches, Drip Cocks, Foundation Bolts, Anchor Plates, Nickel-plated Foundation Nuts, etc. Sub-bases are furnished when desired at additional cost. The power of the Engines in the table is calculated at cutting off at about one-quarter stroke, leaving a liberal reserve capacity above the rated horse power given.

We furnish Tandem and Cross Compound, also Compound Condensing and Special Electric Railway Engines. Write for prices.

Cylinder		Revolutions per minute	Rated Horse Power at $\frac{1}{4}$ cut off, 80 lbs. In't.	Fly Wheels.		Floorspace occup'd		Diameter of Pipes		Shipping Weight in Pounds about
Diameter in inches	Stroke in inches			Diameter in inches	Width Face in inches	Length, Ft.	Width, In.	Steam, Inches	Exhaust, Inches	
6	8	450	20	28 to 30	8	6	6	3	6	2,400
7	8	450	28	30 to 36	8	7	0	4	0	2,500
8	8	450	36	36 to 48	10	7	10	4	5	2,700
8 $\frac{1}{2}$	10	350	40	36 to 48	10	7	10	4	5	4,500
9 $\frac{1}{2}$	10	350	50	42 to 48	10	7	10	4	5	5,000
10	10	350	56	48 to 54	10	8	0	4	5	5,200
11	12	300	70	54 to 60	12	9	3	5	6	7,500
12	12	300	80	54 to 60	12	10	3	5	10	8,000
13	12	300	100	60 to 66	12	10	3	5	10	9,500
14	12	300	110	60 to 66	12	10	3	5	10	10,500
15	14	265	130	60 to 66	14	11	8	6	2	14,800
16	14	265	150	60 to 66	14	11	8	6	2	15,500
16	16	240	156	72 to 80	14	12	9	6	10	17,700
17	16	240	176	72 to 80	14	12	9	6	10	18,500
18	16	240	200	72 to 84	16	13	2	7	0	20,300
19	18	220	225	84 to 88	18	16	8	10	0	25,000
20	18	220	250	84 to 88	18	16	10	10	0	26,000

HORIZONTAL CENTER CRANK ENGINES.**4, 6, 8, 9, 10, 12 AND 15 HORSE POWER.****Plate 1342.**

Number of Size	350	351	352	353	354	355	356
Horse Power	4	6	8	9	10	12	15
Dimensions of Cylinder, inches.	4 x 6	5 x 8	6 x 9	7 x 9	7 x 10	8 x 10	8 x 12
Ordinary Number Revolutions .	240	220	200	200	180	180	150
Size Large Pulley, inches . . .	26 x 6½	32 x 8½	36 x 9½	36 x 9½	44 x 10½	44 x 10½	48 x 12½
Size Small Pulley, inches . . .	14 x 6½	14 x 10½	16 x 10½	16 x 10½	20 x 10½	20 x 10½	22 x 10½
Size of Governor, inches . . .	1	1¼	1¼	1½	1½	2	2
Estimated Weight, pounds . . .	750	900	1,200	1,300	1,600	1,700	2,400
Complete, with Pump and Heater	\$125 00	140 00	160 00	165 00	185 00	195 00	240 00
Without Pump or Heater . . .	\$118 00	130 00	150 00	155 00	172 00	182 00	220 00

Governor, Throttle and all necessary Oil Cups, Cylinder and Pet Cocks are included in above prices.

Steam, Water and Exhaust Pipes, Governor Belts or Foundation Bolts are not included, and will not be furnished unless specially ordered.

The sizes of Pulleys will be changed when necessary, without extra charge, except for extra weight of metal.

HORIZONTAL CENTER CRANK ENGINES.

20, 25, 30, 35, 40 AND 50 HORSE POWER.

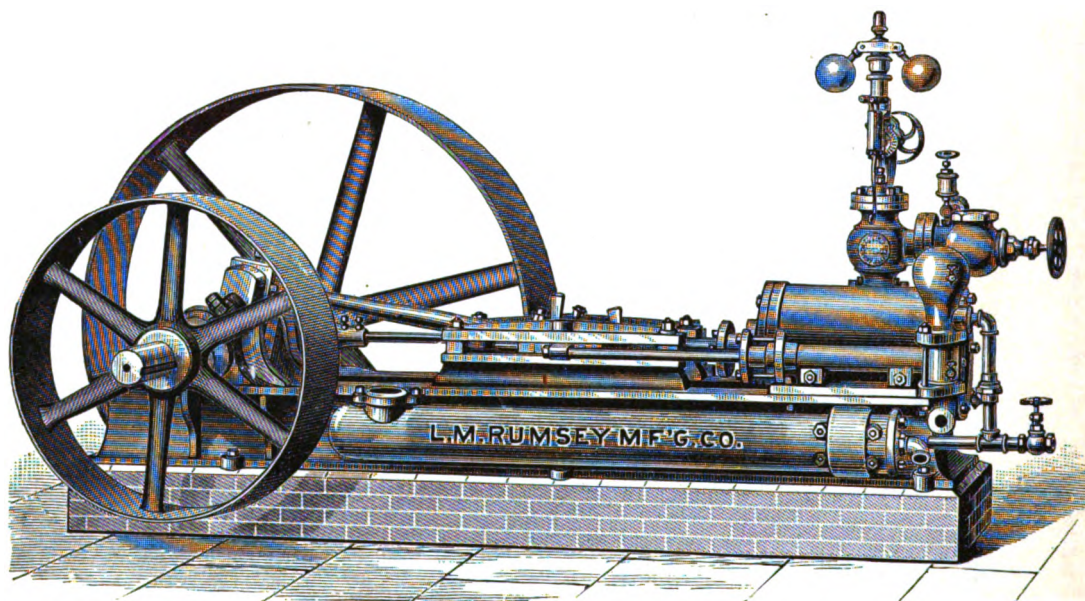


Plate 1343.

Number of Size	357	358	359	360	361	362
Horse Power	20	25	30	35	40	50
Diameter of Cylinder and						
Length of Stroke, inches .	9 x 12	10 x 12	10 x 15	11 x 15	12 x 16	14 x 16
Ordinary Number of Rev. . .	150	150	125	125	125	125
Size Large Pulley, inches . .	48 x 12½	54 x 12½	60 x 12½	60 x 12½	60 x 14½	72 x 16½
Size Small Pulley, inches . .	32 x 8½	32 x 8½	36 x 9½	36 x 9½	36 x 9½	36 x 9½
Size of Governor, inches . .	2¼	2½	2½	2½	3	3½
Estimated Weight, pounds . .	3,000	3,300	4,900	5,200	5,300	7,500
Complete, with Pump and						
Heater	\$290 00	315 00	390 00	420 00	480 00	615 00
Without Pump or Heater . .	265 00	290 00	370 00	395 00	450 00	585 00

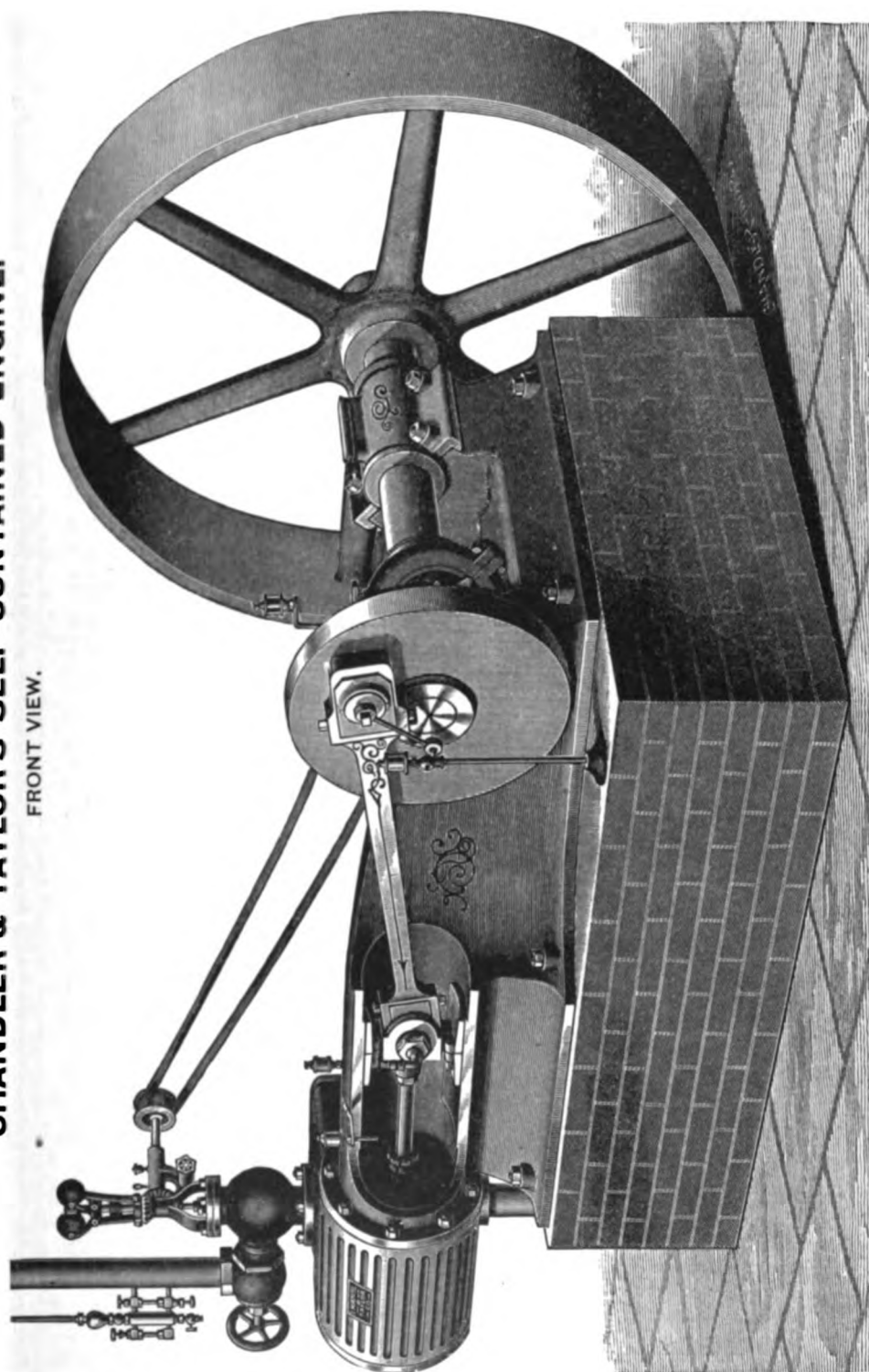
Governor, Throttle and all necessary Oil Cups, Cylinder and Pet Cocks are included in above prices.

Steam, Water and Exhaust Pipes, Governor Belts or Foundation Bolts are not included, and will not be furnished unless specially ordered.

The sizes of Pulleys will be changed when necessary without extra charge, except for extra weight of metal.

CHANDLER & TAYLOR'S SELF-CONTAINED ENGINE.

FRONT VIEW.

**Plate 1344.**

The fixtures included, besides Band-Wheel and Governor, are Stop-Valve, Spanner Wrench, Sight Feed Cylinder Lubricator, Ball Oiler and Stand for Wrist, Wipe Cup for Cross-Head, Drip-Cup for Eccentric, Oil Cups, Drain Cocks and Governor Belt.
 A narrow-rimmed Fly-Wheel of same diameter and weight as Band Fly-Wheel may be substituted at same price.
 The 18 x 22 Engine is built without the self-contained feature for convenience in shipping and handling.

VERTICAL CENTER CRANK ENGINES AND UPRIGHT TUBULAR BOILERS.

COMBINED ON ONE BASE.

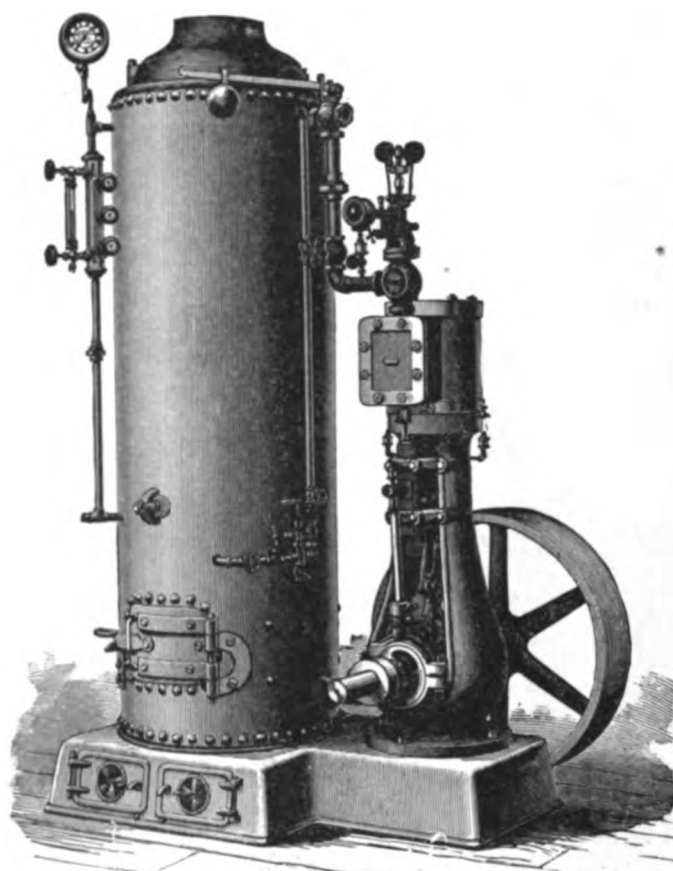
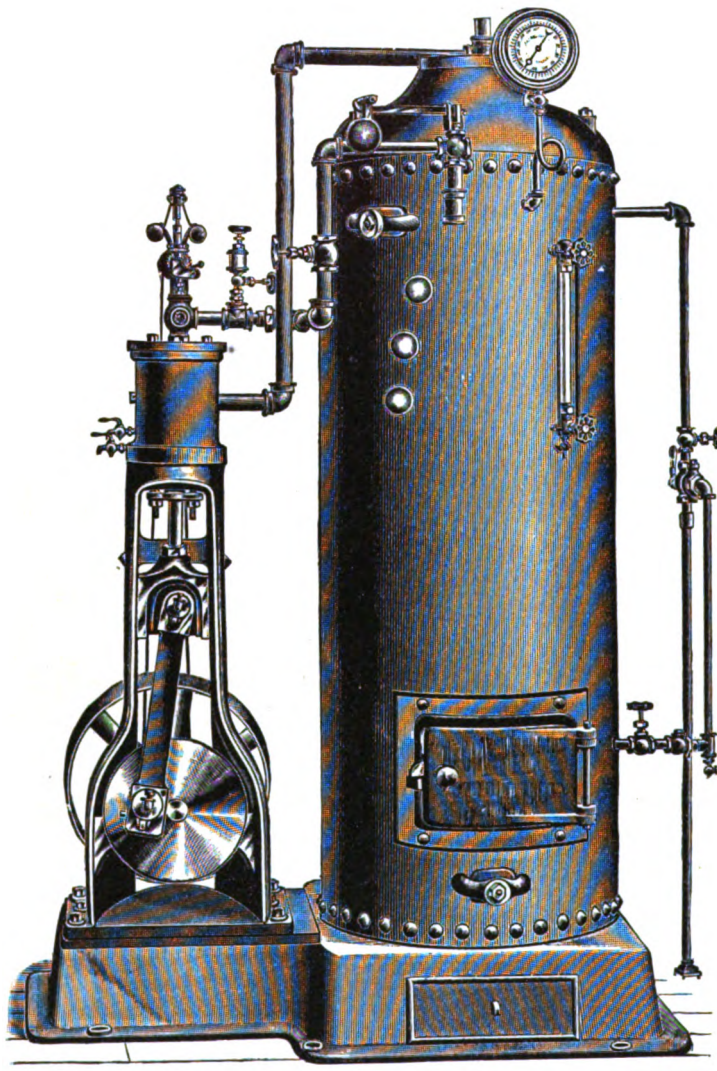


Plate 1345.

	Engines			Boilers				
	Size of Cylinder	Horse Power		Horse Power	Diameter Inches	Height, Feet	No. 2 In. Tubes	
No. 214	3 x 4	2½	4	24	4	30	1,600	\$210 00
No. 215	3½ x 5	3½	4	24	4	30	1,730	225 00
No. 216	4 x 5	4½	5	24	5	30	2,000	250 00
No. 217	5 x 5	6	6	24	6	30	2,200	280 00
No. 218	5 x 5	6	9	30	6	50	2,600	315 00
No. 219	6 x 6	7	9	30	6	50	2,850	335 00
No. 220	7 x 7	10	10	30	7	50	3,850	385 00
No. 221	7 x 7	10	12	36	6	68	4,400	420 00
No. 222	8 x 8	15	15	36	7	68	4,950	470 00
No. 223	8 x 8	15	18	36	8	68	5,150	485 00
No. 224	9 x 9	20	23	42	8	88	6,700	595 00
No. 225	10 x 10	25	27	42	9	88	7,500	675 00

The price includes injectors and pipe connections, grate and all fittings shown in the cut, but no smoke stack or governor belt. Please notice the size of boilers furnished with engines.

VERTICAL ENGINE AND BOILER COMBINED.**SIDE CRANK ENGINE. WATER LEG TUBULAR BOILER.****Plate 1346.**

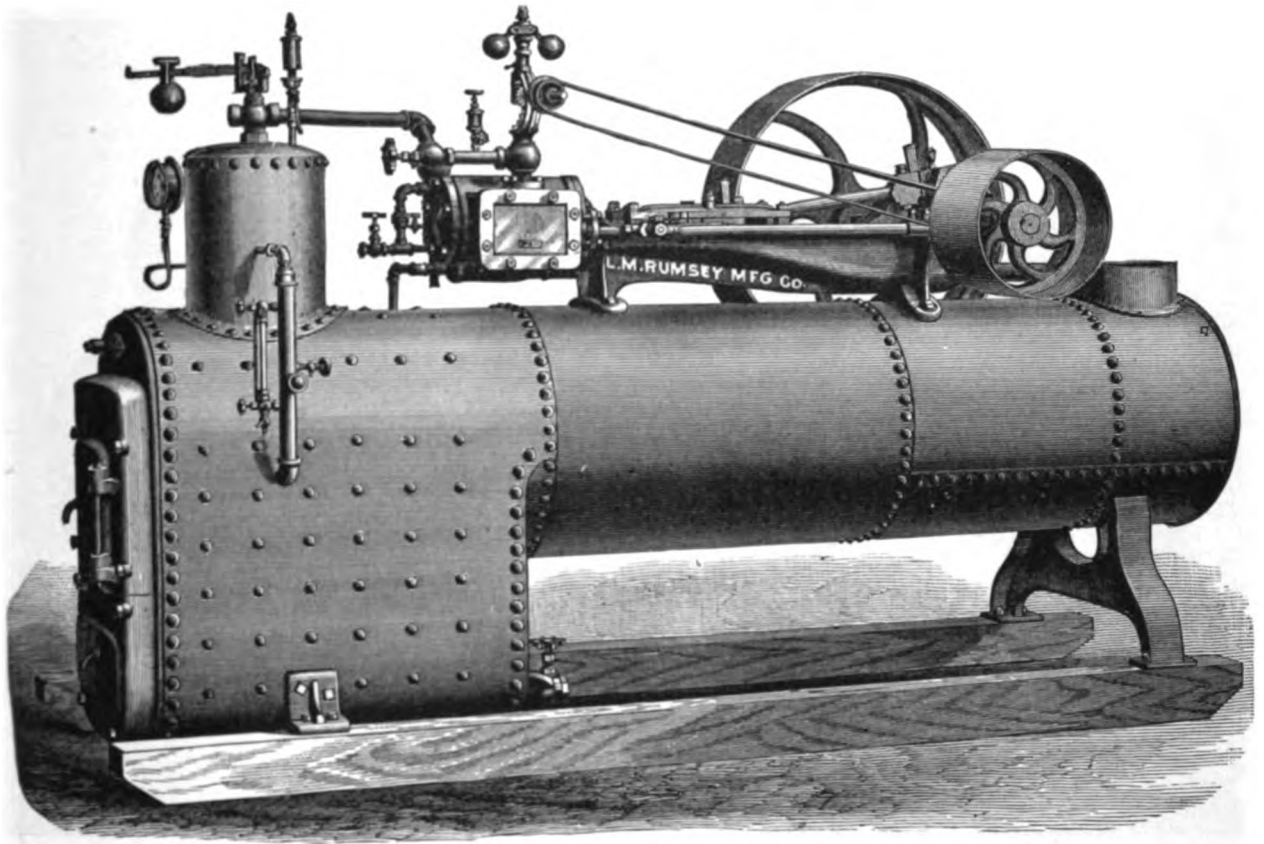
The Engine is a Side Crank, Self-Contained, Straight Line, Vertical Engine, made of the best materials and perfectly proportioned. It is of easy adjustment, with few parts and ample provision for taking up wear. Every strain is in a straight line; the reciprocating parts are perfectly balanced, and it runs with great steadiness. The Bearings are large and easy to get at, and the eccentric adjustment, of new design, is perfect and simple.

The Boiler is a Vertical Tubular with double shell around the fire (water leg), made of best boiler steel of 60,000 pounds tensile strength. Every Boiler is tested with cold water pressure at 150 pounds.

The prices cover the fixtures and fittings shown in the cut. The outfits are complete and ready to run when set up, as shown.

No. of Size	ENGINE				BOILER				Weight, Complete, Lbs.	Prices, Engine and Boiler, Complete
	Cylinder, Inches	H. P. Engine	Revolutions per Minute	Wheel, Diameter and Face, Inches	H. P. Boiler	Shell	Tubes			
						Diameter and Height, Inches	No. 2 In.	Length In.		
250	4 x 4	3	300	14 x 3	3	20 x 42	19	22	1,400	\$135 00
251	4 x 4	3	300	14 x 3	4	24 x 48	24	24	1,600	150 00
252	4 x 4	3	300	14 x 3	5	24 x 54	30	30	1,800	170 00
253	5 x 5	5	250	17 x 4	5	24 x 54	30	30	1,800	185 00
254	5 x 5	5	250	17 x 4	6	24 x 60	31	36	2,000	195 00
255	5 x 5	5	250	17 x 4	7	24 x 66	37	42	2,100	210 00
256	5 x 5	5	250	17 x 4	8	30 x 66	46	42	3,000	240 00
257	6 x 6	7	200	20 x 5	7	24 x 66	37	42	2,200	215 00
258	6 x 6	7	200	20 x 5	8	30 x 66	46	42	3,200	260 00

Smoke Stacks are not included in the prices, but are charged for extra, if wanted.

PORTABLE ENGINES AND BOILERS.**ON SKIDS. 6 TO 15 HORSE POWER.****Plate 1347.**

Number of Size	A	B	C	D	E	F
Horse Power	6	8	9	10	12	15
Diam. of Cyl. and Length of Stroke, in.	5x8	6x9	7x9	7x10	8x10	8x12
Ordinary Number of Revolutions . .	220	200	200	180	180	150
Size of Large Pulley, inches	32x 8½	36x 9½	36x 9½	44x10½	44x10½	48x12½
Size of Small Pulley, inches	14x10½	16x10½	16x10½	20x10½	20x10½	22x10½
Size of Governor, inches	1¼	1¼	1½	1½	2	2
Diameter of Boiler, inches	26	28	28	30	32	32
Length of Furnace, inches	34	36	36	38	38	44
Width of Furnace, inches	21	22	22	24	26	26
Height of Furnace, inches	29	32	32	34	38	38
No. of 3 inch Tubes	17	18	20	22	26	26
Length of Tubes, inches	54	60	60	72	72	78
Diameter of Smoke Stack, inches . .	12	13	13	14	15	15
Length of Smoke Stack, feet	18	18	18	18	20	20
Estimated Weight, complete, pounds	3,800	4,200	4,500	5,400	5,800	7,000
Length over all, feet	8½	9½	9½	10½	10½	12
On Skids, Engine and Boiler, complete, as shown in cut	\$400 00	445 00	460 00	510 00	545 00	615 00

The above sizes of Pulleys will be found suitable for nearly all kinds of work, but will be changed if necessary, and charged for accordingly. With engine and boiler on skids, the price includes smoke stack, governor, heater, pump, governor belt, steam gauge, water gauge, whistle, safety valve, gauge cocks, check and blow-off, oil cups and pet cocks. All engines are thoroughly tested with steam, and are complete, ready for work.

PORTABLE ENGINES AND BOILERS.

ON SKIDS. 20 TO 50 HORSE POWER.

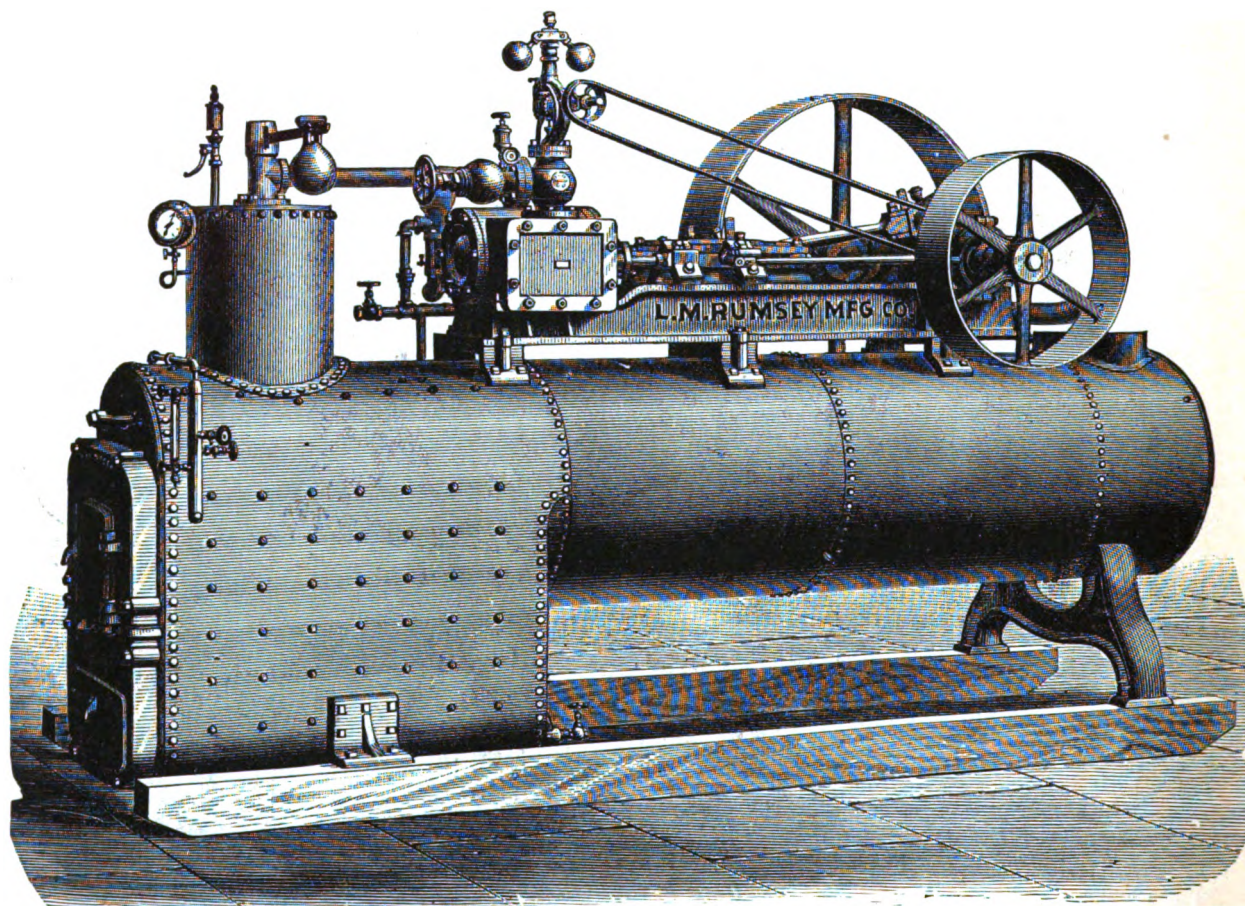


Plate 1348.

Number of Size	G	H	J	K	L	M
Horse Power	20	25	30	35	40	50
Diam. of Cyl. and Length of Stroke, in.	9x12	10x12	10x15	11x15	12x16	14x16
Ordinary Number of Revolutions	150	150	125	125	125	125
Size Large Pulley, inches	48x12½	54x12½	60x12½	60x12½	60x14½	72x16½
Size Small Pulley, inches	32x8½	32x8½	36x9½	36x9½	36x9½	36x9½
Size of Governor, inches	2½	2½	2½	2½	3	3½
Diameter of Boiler, inches	34	36	36	40	40	44
Length of Furnace, inches	52	52	52	52	60	64
Width of Furnace, inches	28	30	30	34	34	38
Height of Furnace, inches	38	40	40	44	44	50
No. of 3 inch Tubes	30	34	34	40	42	48
Length of Tubes, inches	90	96	102	102	120	132
Length of Smoke Stack, feet	24	24	24	30	35	40
Diameter of Smoke Stack, inches	16	18	18	20	20	22
Estimated Weight, pounds	9,000	10,200	12,000	13,000	14,000	18,000
Length over all, feet	13½	14	14½	14½	16½	18
On Skids, Engine and Boiler complete, as shown in cut	\$715 00	790 00	875 00	950 00	1,080 00	1,290 00
On Wheels, complete	885 00	960 00	1,050 00	1,125 00	1,250 00	.....

Sizes L and M have an additional leg between skids and boiler. The above sizes of pulleys will be found suitable for nearly all kinds of work, but will be changed, if necessary, and charged for accordingly. When engines and boilers are ordered on skids, the price includes smoke stack, governor, heater, pump, governor belt, steam gauge, water gauge, whistle, safety valve, gauge cocks, check and blow-off, oil cups and pet cocks. When ordered on wheels, the price includes a short piece of smoke stack and all the other items above mentioned, and in addition thereto brake, hand suction pump, tongue, double-tree, whiffletrees and neck yoke. If any of these parts are not wanted, their prices will be deducted. All outfits are thoroughly tested with steam, and are complete, ready for work.

CHANDLER & TAYLOR'S SEMI-PORTABLE ENGINE AND BOILER.

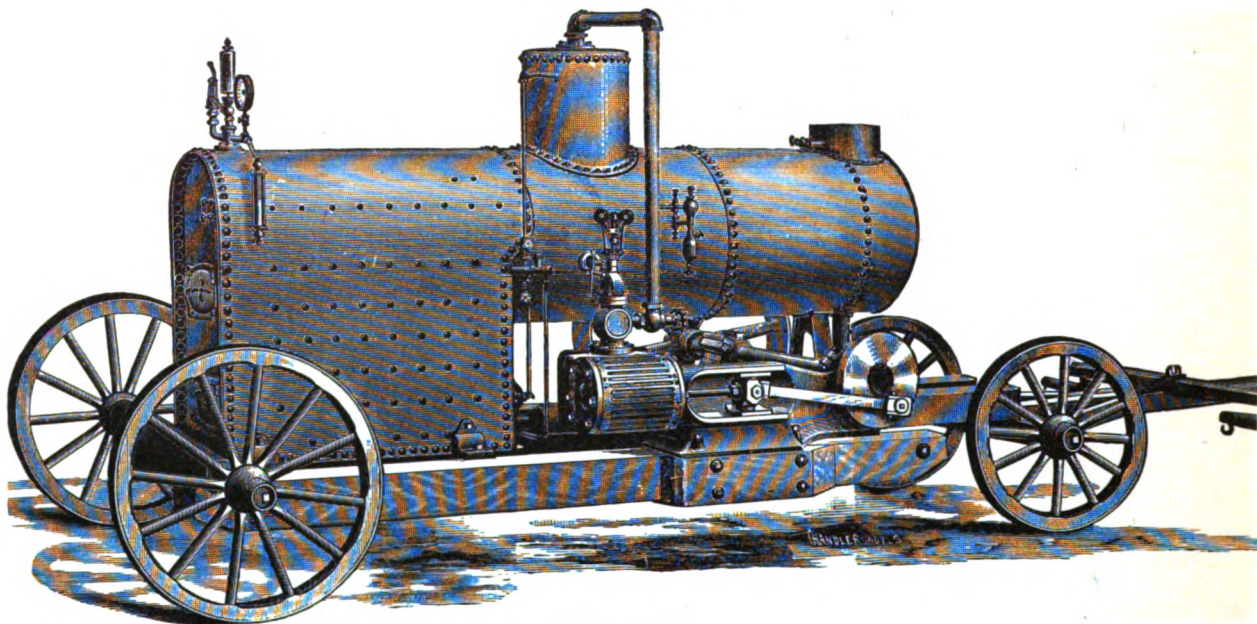


Plate 1350.

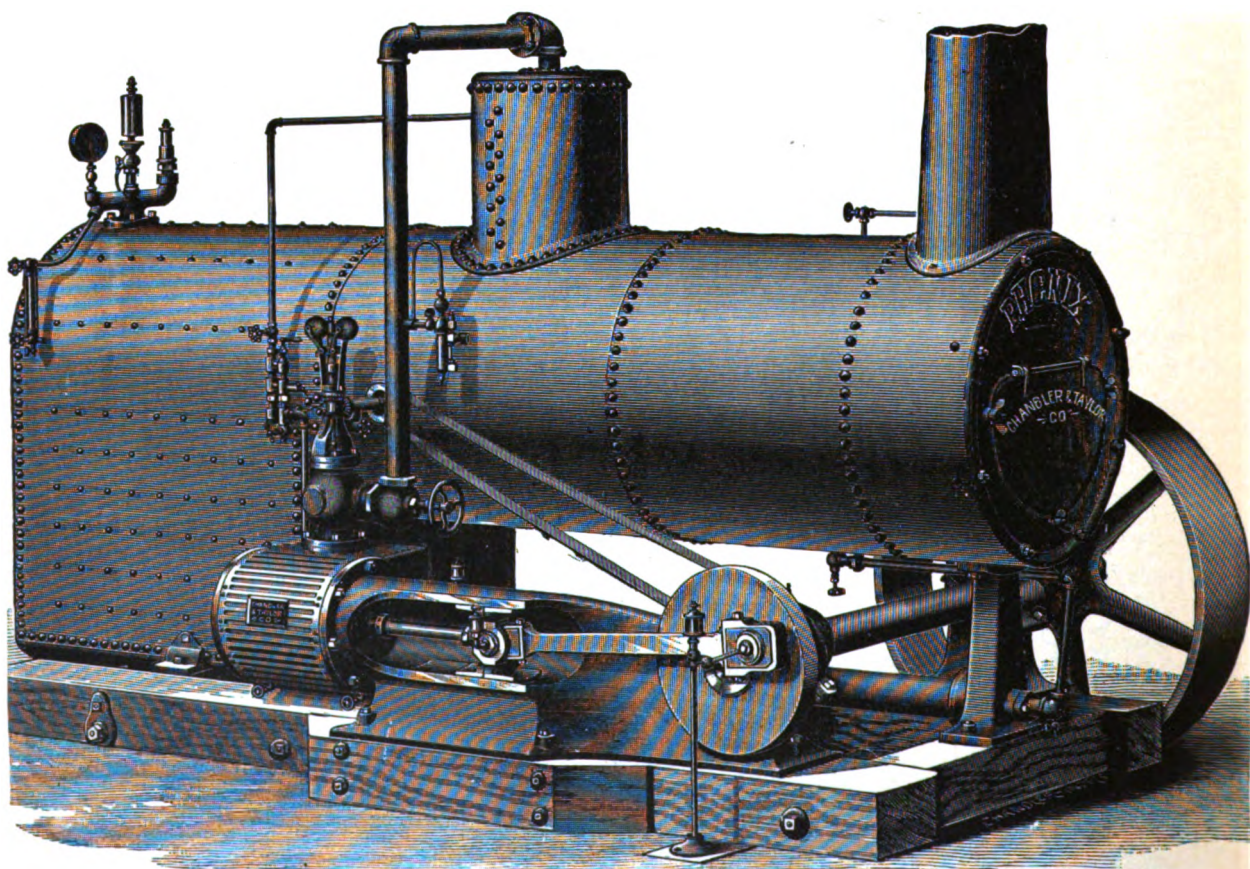


Plate 1351.

For Description, Dimensions and Prices, see next page.

SEMI-PORTABLE ENGINE AND BOILER.

The opposite cuts show our latest design in Semi-Portable Outfits, which we believe more completely combines the advantages of a Stationary with those of Portable than any plan heretofore presented. It is an exceedingly simple design, and can not fail to be appreciated by any one at all conversant with the management of a Steam Engine. The Boiler is of the locomotive type, mounted on heavy timbers, to which the Engine also is attached; these timbers, with the weight of the Boiler and its contents resting on them, form a substantial foundation for the Engine. The pop valve, whistle, steam gauge, water gauge and gauge cocks, are all placed at the fire-box end of the Boiler, within easy reach and directly in sight of the fireman. A feed-water heater is attached to the Boiler, and water is supplied through it by an independent feed-water injector, which admits of the use of the Boiler for steaming or other purposes, entirely independent of the Engine. The Engine used in this combination has all the good features of a Self-Contained Engine, and has governor and all the requisite cocks, valves and oil cups to make it complete and ready for operation. Among the advantages apparent in this combination may be mentioned the following:

The Engine, being located below the Boiler, the Outfit is free from the top-heaviness that is so objectionable in Engines mounted on top of the Boiler, and for this reason can be transported without danger of upsetting. The Engine being entirely disconnected from the Boiler, is not affected by its contraction or expansion, while the Boiler, in turn, is relieved of all strain, except that which is due to the generation of steam. The journals and wearing parts are not subject to the heat of the Boiler, consequently will wear longer and require less oil to overcome their friction. The Engine can be taken off its foundation without disarranging its parts, if it is desirable to divide the load in transporting it over hilly or muddy roads.

Num-ber of Size		ENGINE						BOILER										Total Weight Engine and Boiler, Com-plete, lbs.	Price on Skids, Com-plete as per Cut	Price Extra for Mounting on Wheels				
		Cylinder		Horse Power	Revo. per Min.	Fly Wheel		Dia. Crank Shaft, in.	Dia. Gover-nor, in.	Dia. Shell, in.	Fire Box			Tubes		Thickness Material					Smoke Stack			
						Dia., in.	Face, in.				Length, in.	Width, in.	Height, in.	No.	Dia., in.	Length, in.	Shell, in.				Tube Sheet, in.	Dia., in.	Length, ft.	Thick., No.
650	7	10	15	240	40	8½	3¾	2		30	42	25	21	34	2¼	72	¾	¾	12	18	16	5,700	\$600 00	\$130 00
651	8	10	20	240	44	10½	3¾	2		33	44	28	26	41	2¼	84	¾	¾	14	20	16	7,300	675 00	160 00
652	9	12	25	200	48	12½	4¾	2½		36	48	31	28	54	2¼	84	¾	¾	16	20	16	9,200	825 00	180 00
653	10	12	30	200	54	12½	4¾	2½		36	54	31	31	43	2½	108	¾	¾	18	24	16	10,000	950 00	200 00

THE RUMSEY TUBULAR FEED WATER HEATER.

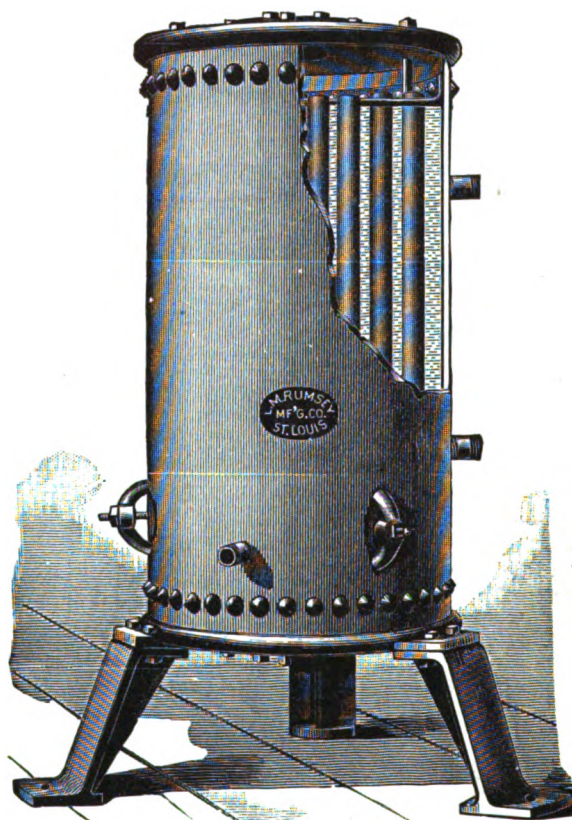


Plate 1352.

Our Tubular Feed Water Heater is simple in construction and efficient in operation. A steam chamber is provided at each end of the Heater. The inner heads are connected by 2 inch tubes, and the outer heads are held in place by bolts, and are easily removed. Hand holes conveniently placed afford ready access for cleaning. The body of the Heater is kept constantly filled with water surrounding the tubes and the exhaust steam from the engine passes through the tubes.

This Heater is not open to the very serious objections found in the use of all those where exhaust steam is brought into immediate contact with the feed water. In all that class of heaters, more or less oil from the cylinder of the engine is constantly passing into the boiler with the feed water, and in time coats the inner surface of the boiler, forming a non-conducting surface which will repel the water when the boiler is heated, and cause the plates to warp and crack. A safety valve is furnished with each Heater, but all connecting steam and water pipes are subject to order, and extra charge.

Number of Size	O	P	R	S	T	U	V	W	Y	Z
For Engines of following H. P. . . .	35	50	60	80	100	150	200	300	400	500
Diameter of Shell, inches	20	20	20	24	24	30	30	36	42	42
Height of Shell, inches	42	42	48	48	52	58	68	78	84	84
No. of Tubes, all 2 inch Diameter . .	15	20	20	27	32	46	52	66	80	100
Length of Tubes, inches	80	80	86	86	86	42	48	54	60	60
Thickness of Shell, inches	7-32	7-32	7-32	7-32	7-32	1/4	1/4	1/4	9-32	9-32
Thickness of Heads, inches	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Diam. of Exhaust Opening, inches . .	3	3 1/2	4	4 1/2	4 1/2	6	7	10	10	10
Diameter of Feed Pipe, inches . . .	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2	2	2 1/2	2 1/2
Size of Safety Valve, inches	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	2	2	2	2 1/2
Weight in pounds, about	1,000	1,060	1,100	1,300	1,400	1,800	2,000	2,800	3,400	3,600
Iron Tubes	\$ 80 00	85 00	95 00	115 00	125 00	155 00	170 00	235 00	295 00	330 00
Copper Tubes	\$105 00	125 00	140 00	175 00	190 00	280 00	340 00	450 00	550 00	700 00

FEED WATER HEATER.

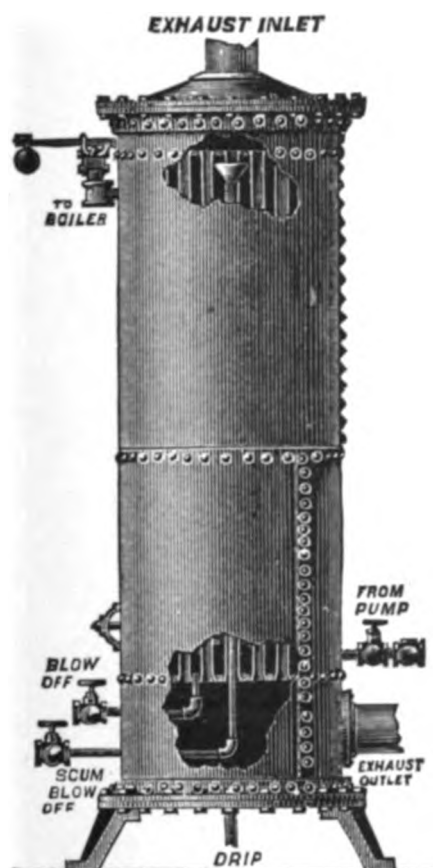


Plate 1353.

The shell of heater is of steel; the flues of seamless drawn brass, No. 13 W. G., and will not collapse; the flue heads flanged with a special rounding flange, so there is no possibility of leaking from unequal expansion. Each heater is subjected to a test of 150 pounds pressure before leaving shop, and guaranteed to be perfectly tight. All openings are threaded, unless otherwise ordered, excepting 12 inch and larger, which are flanged. The exhaust steam from engines or pumps enters heater at the top, and passes down through the flues and out at the side near the bottom. The feed water enters heater on side near bottom at opening marked "from Pump," and passing through heater is taken off near top at opening marked "to Boiler," the water being around the flues, and exhaust steam inside the flues. The water is taken off near top, where exhaust steam enters, and by this principle we claim to be able to heat the feed water hotter and faster than any other heater in the market. For cleaning out scum and sediment blow-off pipes are provided which are to be used frequently, and hand-hole plates for the purposes of cleaning out. The scum blow-off is in the shape of a funnel, and by using same the light vegetable impurities which float on the water can be blown out from time to time. The earthy matter which settles can be blown out through the sediment blow-off.

Size	Horse Power will Supply	Diameter Shell, Inches	No. of 2 Inch Brass Tubes	Length of Tubes, Feet	Diameter of Exhaust, Inches	Height, without Legs, Ft. In.	Price
No. 433	30	16	6	5	3	7 6	\$ 185 00
No. 434	40	16	8	6	3	8 0	200 00
No. 435	50	18	10	6	4	8 0	230 00
No. 436	75	18	12	6	5	8 6	275 00
No. 437	100	20	14	6	6	8 0	315 00
No. 438	125	24	14	6	6	8 0	330 00
No. 439	150	24	14	8	6	10 0	385 00
No. 440	200	24	18	8	6	10 6	440 00
No. 441	250	30	24	8	7	11 0	495 00
No. 442	300	30	30	10	8	12 6	550 00
No. 443	400	36	34	8	8	11 0	660 00
No. 444	500	36	38	10	10	13 0	750 00
No. 445	600	42	42	10	10	13 0	825 00
No. 446	700	42	44	10	12	13 6	910 00
No. 447	800	48	50	10	12	13 0	1,045 00
No. 448	1,000	48	56	10	15	13 6	1,130 00
No. 449	1,200	48	60	12	18	15 0	1,210 00

PLAIN VERTICAL TUBULAR BOILERS.

WITH FULL LENGTH TUBES.

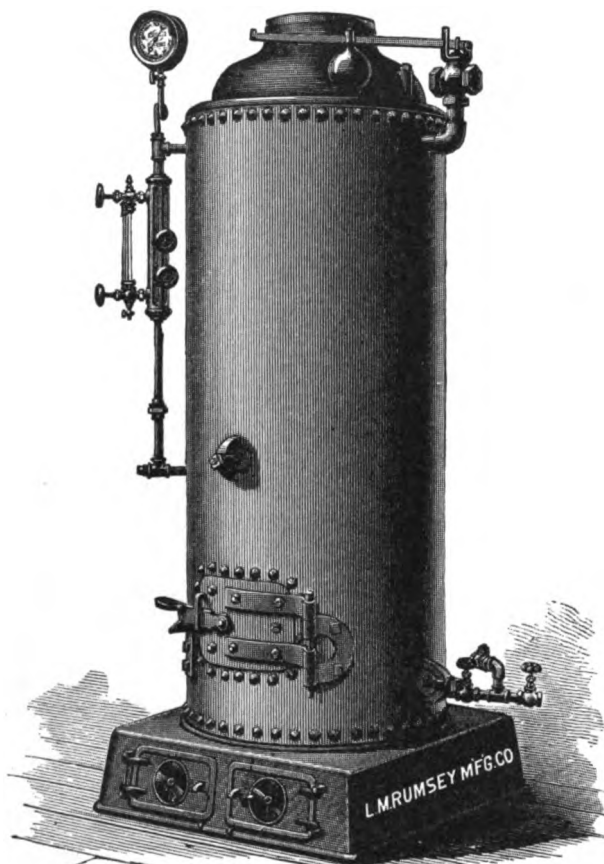


Plate 1354.

Made in 17 sizes, from 4 to 60 horse power.

These Boilers are made of the best quality of steel, and are tested at 150 pounds pressure before leaving the works.

Bases of cast iron, with large ash doors; hoods of improved patterns; hand holes above crown sheet and in bottom of water leg.

Fittings comprise steam gauge, water gauge, gauge cocks, safety valve, blow-off valve, check and stop valves, and injector.

Smoke stacks are not included in prices but are charged for extra, if wanted.

No. of Size	Horse Power	Shell, Diam., In.	Shell, Height, Ft.	Furnace Diam., In.	Furnace Height, In.	Thick-ness, Shell, In.	Thick-ness, Heads, In.	Tubes, No. 2 In.	Tubes, Length, In.	Heating Sur-face, Sq. Ft.	Weight, Com-plete, Lbs.	Price, Com-plete
450	4	24	4	20	24	$\frac{1}{4}$	$\frac{3}{8}$	30	24	45	1,180	\$ 95 00
451	5	24	5	20	24	$\frac{1}{4}$	$\frac{3}{8}$	30	36	60	1,280	110 00
452	6	24	6	20	24	$\frac{1}{4}$	$\frac{3}{8}$	30	48	75	1,380	115 00
453	7	30	5	25	27	$\frac{1}{4}$	$\frac{3}{8}$	50	33	90	1,760	130 00
454	9	30	6	25	27	$\frac{1}{4}$	$\frac{3}{8}$	50	45	118	1,960	145 00
455	12	30	7	25	27	$\frac{1}{4}$	$\frac{3}{8}$	50	57	148	2,160	155 00
456	12	36	6	31	27	$\frac{3}{8}$	$\frac{3}{8}$	68	45	151	2,730	180 00
457	15	36	7	31	27	$\frac{3}{8}$	$\frac{3}{8}$	68	57	186	2,980	195 00
458	18	36	8	31	27	$\frac{3}{8}$	$\frac{3}{8}$	68	69	221	3,230	210 00
459	23	42	8	37	33	$\frac{3}{8}$	$\frac{3}{8}$	88	63	280	4,000	260 00
460	27	42	9	37	33	$\frac{3}{8}$	$\frac{3}{8}$	88	75	325	4,300	275 00
461	31	42	10	37	33	$\frac{3}{8}$	$\frac{3}{8}$	88	87	383	4,600	300 00
462	36	48	9	43	33	$\frac{1}{2}$	$\frac{3}{8}$	124	75	435	5,625	375 00
463	41	48	10	43	33	$\frac{1}{2}$	$\frac{3}{8}$	124	87	500	6,025	390 00
464	47	48	11	43	33	$\frac{1}{2}$	$\frac{3}{8}$	124	99	565	6,425	410 00
465	50	54	10	48	33	$\frac{1}{2}$	$\frac{3}{8}$	150	87	608	7,425	465 00
466	60	60	11	55	36	$\frac{1}{2}$	$\frac{3}{8}$	171	96	720	9,050	570 00

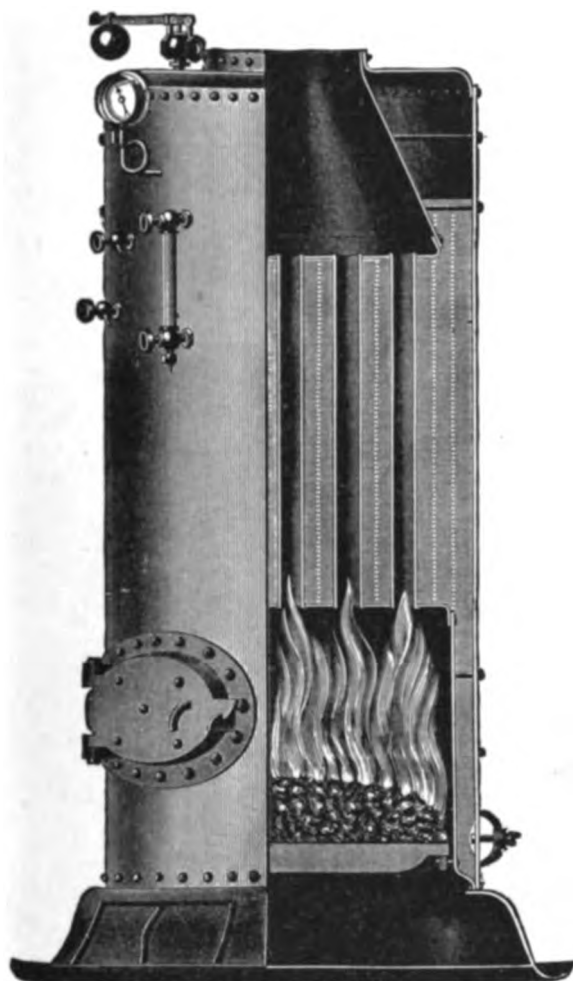
VERTICAL BOILERS.**WITH SUBMERGED TUBES.**

Plate 1355.

A glance at the engraving is sufficient to demonstrate the merits of this style of Vertical Boilers. They are so constructed that the water line is above the Tubes. The tops of the Tubes, instead of being above the water, are submerged, thus removing the tendency to burn them by over heating.

These Boilers are strongly braced and stayed in the most approved manner, and the workmanship throughout is first-class, and all are made of the best material.

They are all tested by hydrostatic pressure to 150 pounds per square inch.

We specially recommend them for pumping, as well as for running Engines, or other purposes where steam is required.

No.	Horse Power	Diameter Shell, Inches	Height Shell, Inches	2 Inch Flues		Heating Surface, Sq. Feet	Weight		Price, Complete
				No.	Length, Inches		Boiler, Pounds	Castings, Pounds	
1	2 $\frac{1}{2}$	22	60	18	24	32	700	150	\$140 00
2	3	22	72	18	36	40	800	150	145 00
3	4 $\frac{1}{2}$	25	72	20	36	55	1,100	350	160 00
4	5 $\frac{1}{2}$	25	84	20	48	68	1,250	350	170 00
5	6 $\frac{1}{2}$	30	72	42	36	80	1,500	500	190 00
6	7 $\frac{1}{2}$	30	78	42	42	90	1,575	500	200 00
7	8	30	84	42	48	100	1,650	500	210 00
8	9	35	72	60	36	110	1,800	850	235 00
9	10	35	78	60	42	125	1,900	850	250 00
10	11	35	84	60	48	140	2,000	850	265 00
11	12	42	72	86	36	154	2,400	1,100	305 00
12	14	42	78	86	42	174	2,550	1,100	325 00
13	16	42	84	86	48	195	2,700	1,100	345 00
14	18	42	90	86	54	216	2,850	1,100	365 00

When furnished complete, the prices include Cast Iron Base, Grate, Injector, Safety Valve, Steam and Water Gauges, Gauge Cocks, Feed, Check and Blow-off Valve.

Smoke Stacks, if wanted, are charged for extra.

PORTABLE OR FIRE BOX STEEL BOILERS, WITH FIRE FRONT AND WATER BOTTOM.

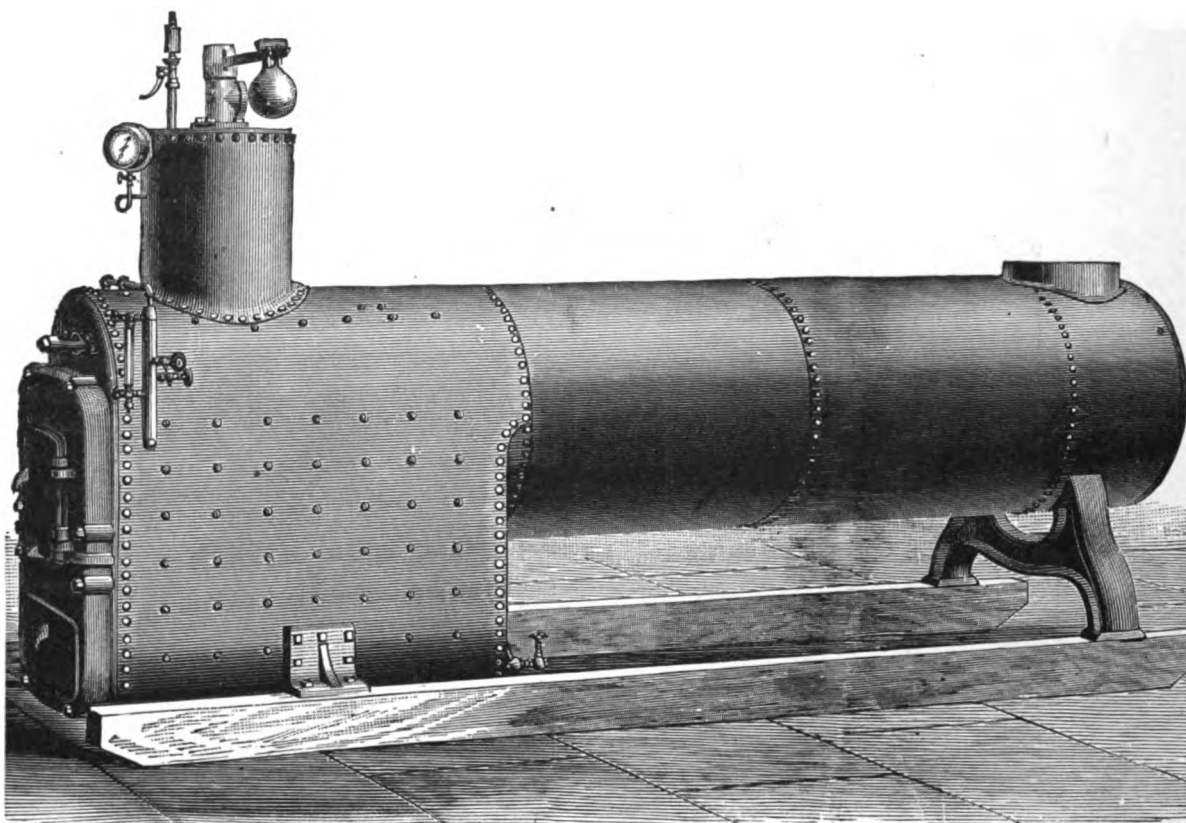
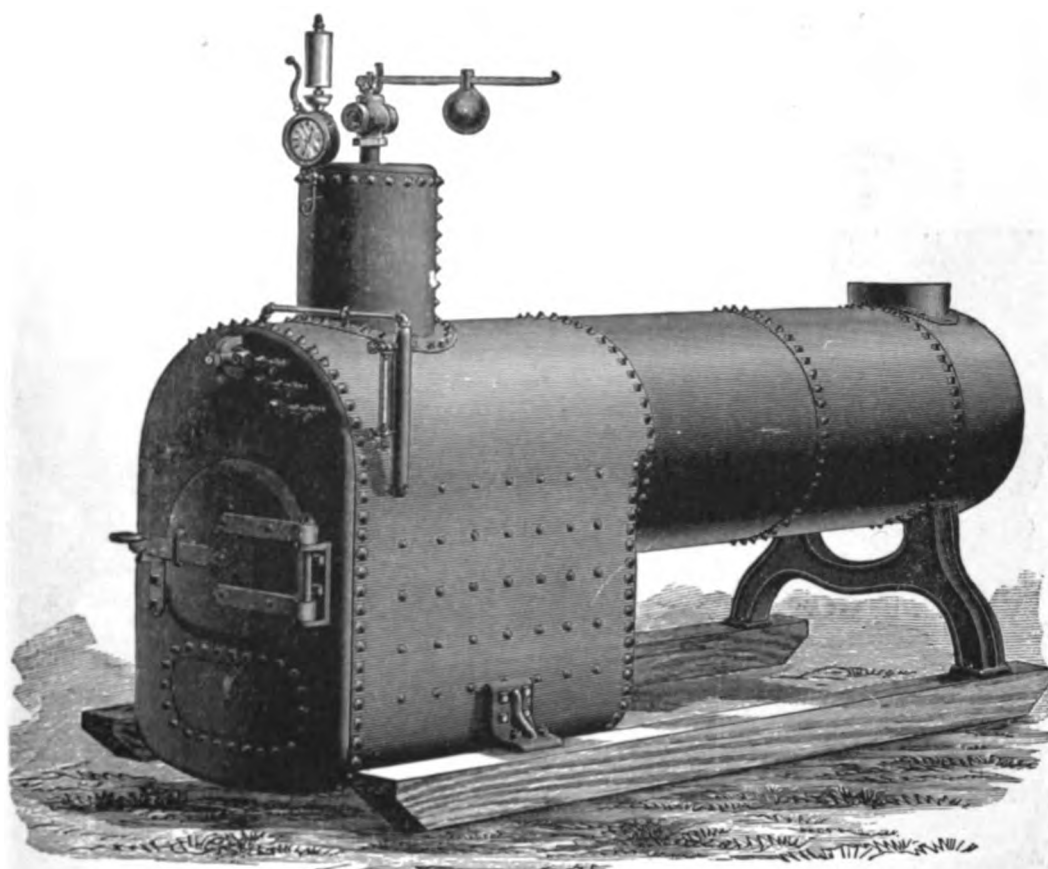


Plate 1356.

Number of Size	130	131	132	133	134	135	136	137	138	139	140	141	142
Horse Power	6	8	9	10	12	15	20	25	30	35	40	50	60
Diameter of Boiler in.	26	28	28	30	32	32	34	36	36	40	40	44	48
Length of Furnace in.	34	36	36	38	38	44	52	52	52	52	60	64	64
Width of Furnace in.	21	22	22	24	26	26	28	30	30	34	34	38	42
Height of Furnace in.	29	32	32	34	38	38	38	40	40	44	44	50	52
Number of 3-inch Tubes . . .	17	18	20	22	26	26	30	34	34	40	42	48	52
Length of Tubes in.	54	60	60	72	72	78	90	96	102	102	120	132	144
Diameter of Smoke Stack . . in.	12	13	13	14	15	15	18	18	18	20	20	22	22
Length of Smoke Stack . . ft.	18	18	18	18	20	20	24	24	24	30	35	40	45
Estimated Weight lbs.	2,900	3,200	3,400	3,800	4,300	4,600	5,700	6,600	7,100	7,800	8,700	10,500	12,000
Price, Without Fixtures . . .	\$195 00	\$215 00	\$225 00	\$245 00	\$265 00	\$285 00	\$320 00	\$360 00	\$375 00	\$415 00	\$490 00	\$555 00	\$645 00
Price, Complete	225 00	240 00	260 00	285 00	310 00	330 00	380 00	425 00	435 00	490 00	565 00	655 00	755 00

Fixtures comprise Smoke Stacks, Grate, Safety Valve, Gauge Cocks, Steam Gauge, Whistle, Water Gauge, Blow-off, Stock and Check Valves.

All Boilers thoroughly tested with steam before shipment and are ready for work.

PORTABLE STEEL BOILERS.**WATER FRONT AND WATER BOTTOM.****Plate 1357.**

Number of Size	Horse Power	Diam. Boiler, Inches	Length Fire Box, Inches	Width Fire Box, Inches	Height Fire Box, Inches	Number 3 Inch Tubes	Length Tubes, Inches	Steel in Shell, Inches	Steel in Fire Box, Inches	Steel in Heads, Inches	Diameter of Dome, Inches	Height of Dome, Inches	Sq. Feet Heating Surface	Diam. Smoke Stack, Inches	Length Smoke Stack, Feet	Estimated wt., complete, Lbs.	Price, Bare	Price, Complete
145	15	32	38	26	38	24	84	1 $\frac{1}{4}$	5-16	2 $\frac{1}{2}$	16	18	177	15	24	4,800	\$ 310 00	\$ 360 00
146	20	34	48	28	38	30	96	1 $\frac{1}{4}$	5-16	2 $\frac{1}{2}$	17	20	235	16	28	5,400	355 00	415 00
147	25	36	52	30	40	34	96	1 $\frac{1}{4}$	5-16	2 $\frac{1}{2}$	18	22	280	18	28	6,400	380 00	450 00
148	30	40	52	34	44	38	102	9-32	5-16	2 $\frac{1}{2}$	20	22	316	20	30	7,800	475 00	550 00
149	35	44	52	38	50	46	96	9-32	5-16	2 $\frac{1}{2}$	22	24	361	22	32	9,000	535 00	615 00
150	40	44	52	38	50	46	114	9-32	5-16	2 $\frac{1}{2}$	22	24	416	22	32	9,600	560 00	650 00
151	45	48	52	42	52	53	114	5-16	5-16	2 $\frac{1}{2}$	24	26	464	24	32	10,800	660 00	750 00
152	50	48	60	42	52	53	132	5-16	5-16	2 $\frac{1}{2}$	24	26	547	24	38	11,500	710 00	820 00
153	60	52	60	46	58	64	126	5-16	5-16	2 $\frac{1}{2}$	28	30	627	26	36	12,500	740 00	850 00
154	70	52	63	46	58	64	144	5-16	5-16	2 $\frac{1}{2}$	28	30	705	26	42	13,000	785 00	910 00
155	75	56	63	50	60	76	132	11-32	5-16	7-16	30	30	766	28	38	15,000	860 00	985 00
156	80	56	63	50	60	76	144	11-32	5-16	7-16	30	30	825	28	42	16,000	895 00	1,025 00
157	95	60	63	54	62	76	168	3 $\frac{1}{8}$	5-16	7-16	32	30	953	28	50	19,000	1,025 00	1,130 00
158	110	60	66	54	62	85	180	3 $\frac{1}{8}$	5-16	7-16	32	30	1,138	30	52	20,000	1,100 00	1,260 00
159	140	66	72	58	64	108	180	3 $\frac{1}{8}$	5-16	7-16	34	30	1,407	32	52	22,000	1,235 00	1,400 00
160	150	66	78	58	64	114	192	3 $\frac{1}{8}$	5-16	7-16	34	30	1,574	34	56	24,000	1,310 00	1,500 00
161	160	72	78	64	68	140	168	7-16	5-16	1 $\frac{1}{2}$	36	28	1,616	38	50	27,000	1,465 00	1,650 00

All Boilers are furnished with hand-holes, and in shell of boilers 60 horse power and larger, one man-hole is provided.

All Boilers are mounted on skids, unless otherwise ordered.

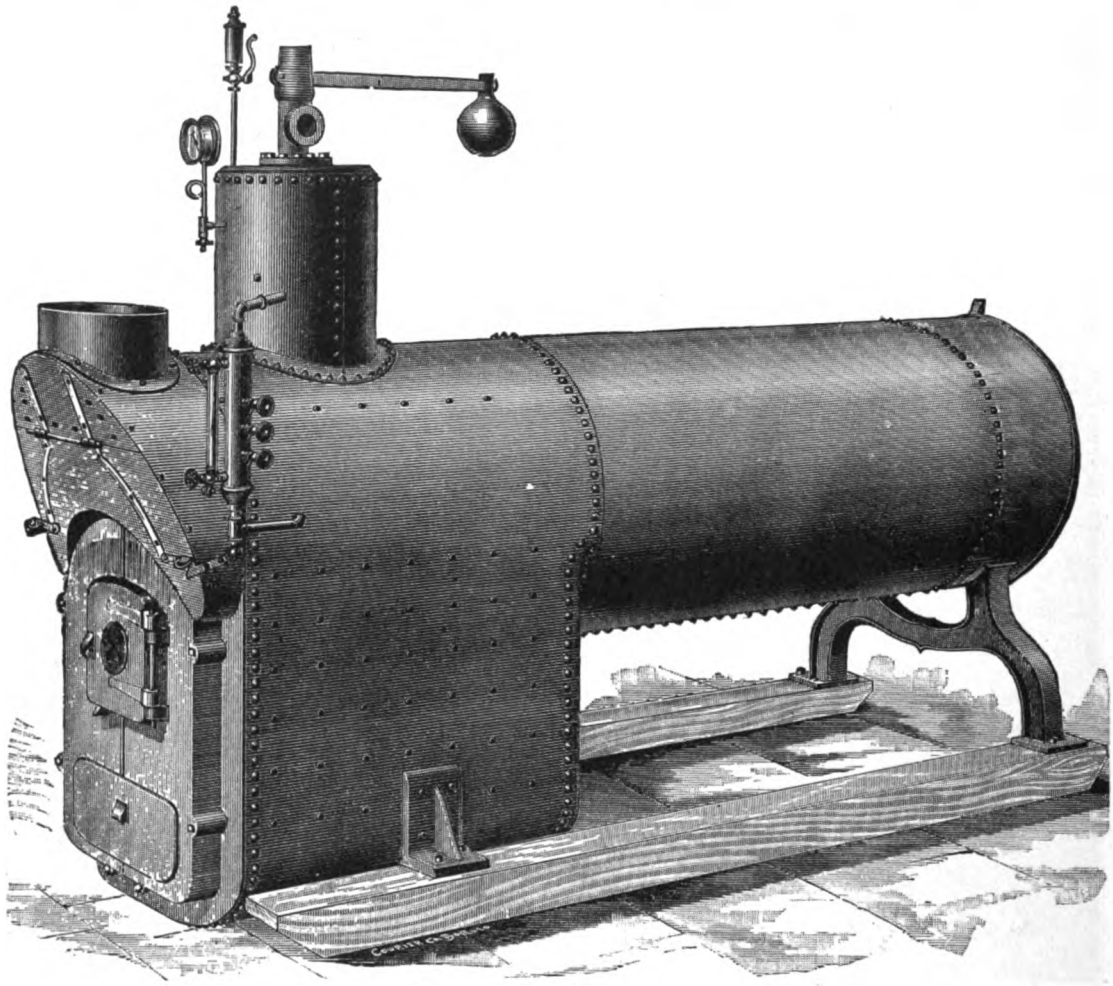
Boilers 50 horse power and larger will have cast iron legs necessary for support, in addition to those shown in cut.

All Boilers have longitudinal seams double riveted.

Boilers 45 horse power and larger have dome double riveted to shell.

Boilers 60 horse power and larger have the dome on the waist of the Boiler, instead of over the fire box.

Boiler fixtures comprise smoke stack, galvanized iron guys (four times the length of stack), grates, safety valve, steam gauge, water gauge, gauge cocks, whistle, blow-off, check and stop valves.

ELECTRIC RETURN TUBULAR PORTABLE BOILER.**Plate 1358.**

Number of Size	812	813	814	815	816	817	817½	818	819	820
Horse Power, as usually rated . . .	10	12	15	20	25	30	35	40	50	60
Diameter of Boiler, inches	32	32	40	40	44	44	50	50	54	60
Length of Furnace, inside, inches . .	35	35	38	44	44	44	53	53	53	60
Width of Furnace, inside, inches . .	26	26	34	34	38	38	44	44	48	54
Thickness of Shell, inches	¼	¼	9-32	9-32	9-32	9-32	5-16	5-16	5-16	5-16
Thickness of Tube Sheets, inches . .	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Number of 3 inch Tubes	16	16	22	22	30	30	40	40	50	60
Length of 3 inch Tubes, inches . . .	72	84	84	102	96	108	108	120	114	114
Number of 4 inch Tubes	10	10	12	12	16	16	20	20	28	34
Length of 4 inch Tubes, inches . . .	38	51	48	60	54	66	57	69	68	56
Diameter of Dome, inches	18	18	20	20	24	24	26	26	28	32
Height of Dome, inches	18	18	20	20	22	22	24	24	24	28
Diameter of Stack, inches	12	12	14	14	18	18	20	20	22	24
Length of Stack, feet	30	35	35	40	40	45	45	50	50	50
Length of Boiler over all, ft., about .	8½	9½	9½	11	11	12	12	13	12½	12½
Width of Boiler over all, in., about .	33	33	41	41	45	45	51	51	56	61
Weight of Boiler, lbs., about	4,200	4,400	5,500	6,000	7,000	8,000	8,500	9,500	11,000	13,200
Weight of Fixtures, lbs., about . . .	700	800	900	1,000	1,200	1,300	1,500	1,700	1,900	2,100
Weight complete, on skids, lbs., about	4,900	5,200	6,400	7,000	8,500	9,300	10,000	11,200	12,900	15,300
Boiler, only, on skids	\$310 00	\$25 00	\$85 00	\$415 00	\$490 00	\$515 00	\$610 00	\$635 00	\$735 00	\$840 00
Fixtures and Fittings, only	\$ 55 00	65 00	65 00	65 00	85 00	85 00	90 00	110 00	115 00	140 00
Complete, on skids	\$365 00	390 00	450 00	490 00	575 00	600 00	700 00	745 00	850 00	980 00
Complete, on wheels	\$525 00	550 00	610 00	650 00	740 00	770 00	880 00	915 00	1,035 00	1,165 00

Fixtures comprise Grates, Steam Gauge, Water Gauge fitted with Stand Pipe, Gauge Cocks, Whistle and Pipe, Safety Valve, Blow-Off Valve, Check and Stop Valves, Smoke Stack and Guys.
All Smoke Stacks are made of No. 16 Iron; if heavier is required, a proportionate charge will be made.

SIX-INCH FLUE STATIONARY BOILER.

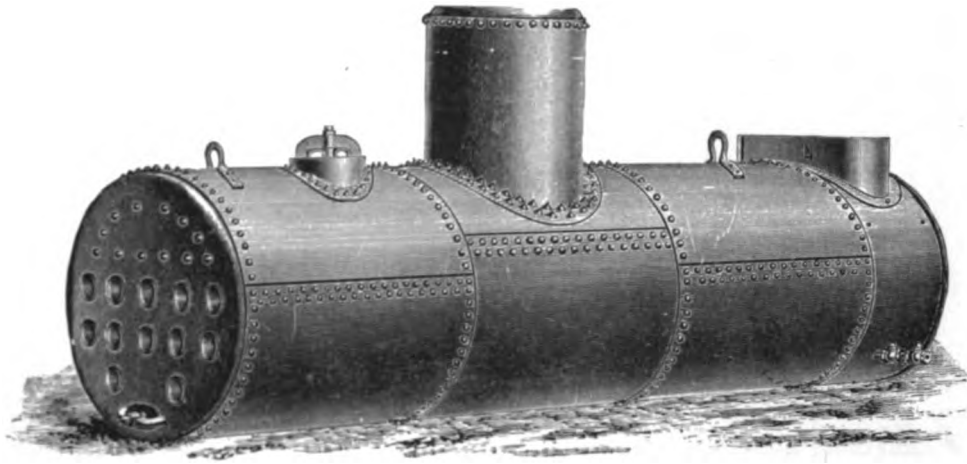


Plate 1359.

These Boilers are very carefully constructed and made in the best manner throughout.

The longitudinal seams of the Shells are double riveted, and the Domes on all Boilers 42 inches and larger in diameter are double riveted to the Shell; the Heads and Domes are thoroughly braced in the most approved manner.

Our "Standard" Boilers of this style are made throughout of open hearth homogeneous flange steel plate.

SIX-INCH FLUE STATIONARY BOILERS.—FLUES RIVETED IN.

Number of Size	521	522	523	524	525	526	527	527½	528	528½	529	530
Horse Power	25	30	35	40	50	60	70	75	80	90	100	112
Diameter of Boiler	40	44	48	50	54	58	60	60	66	66	72	72
Thickness of Shell	9-32	9-32	9-32	5-16	5-16	5-16	11-32	11-32	11-32	¾	¾	¾
Thickness of Heads	¾	¾	¾	¾	¾	¾	7-16	7-16	7-16	7-16	7-16	7-16
Length of Flues	14	14	17	16	18	20	20	20	20	20	20	20
No. of Flues (6 in. diam.)	7	8	8	10	12	12	15	16	18	20	22	26
Diameter of Dome	30	22	22	26	26	30	32	32	32	36	36	40
Height of Dome	22	24	24	28	28	34	36	36	36	40	40	40
Length of Grate Bars	48	48	48	48	54	54	54	54	54	54	54	54
Width of Grate Bars	40	44	44	48	50	54	58	60	60	66	66	72
Diameter of Smoke Stack	16	18	18	20	22	22	24	24	26	28	28	32
Length of Smoke Stack	40	40	50	50	50	50	50	50	50	60	60	60
Weight Boiler and Fittings	4,300	4,800	5,500	6,500	7,700	8,900	10,700	10,900	11,500	13,000	14,000	15,400
Weight Boiler Fixtures	2,800	2,850	2,900	3,450	3,800	3,900	4,500	5,100	5,100	6,000	6,000	7,600
Weight Boiler and Fixtures	7,100	7,650	8,400	9,950	11,500	12,800	15,200	16,000	16,600	19,000	20,000	23,000

Boiler Fixtures comprise Half Arch Front with liners for Fire Brick, Grates, Grate Bearers, Boiler Stand, Rear Arch Bars, Ash Door and Frame, Safety Valve, Steam Gauge, Water Gauge fitted with Stand Pipe, Gauge Cocks, Whistle and Pipe, Blow-off Valve, Check and Stop Valves, Smoke Stack and Guys (four times the length of Stack). Anything called for and not in this list will be charged as an extra.

Sawdust Grates will be substituted for regular Grates, when ordered, without extra charge.

All Smoke Stacks, up to and including 28 inches in diameter, are made of No. 16 Iron, and larger sizes of No. 14; if heavier is required a proportionate charge will be made.

Full Arch Fronts, Wall Brackets, Wall Plates and Rollers, Binding Bars and Rods, Stack Plates and Anchor Bolts, are all subject to order and charged extra.

Boilers over 36 inches in diameter have a Man-hole in the Shell, and all over 40 inches in diameter have an extra Man-hole in Front Head below Flues.

The loops for hanging Boiler, shown in the cut, are not put on Boilers less than 48 inches in diameter, unless ordered.

Write for prices, stating just what you need. Can furnish any size wanted.

STATIONARY TUBULAR BOILERS.

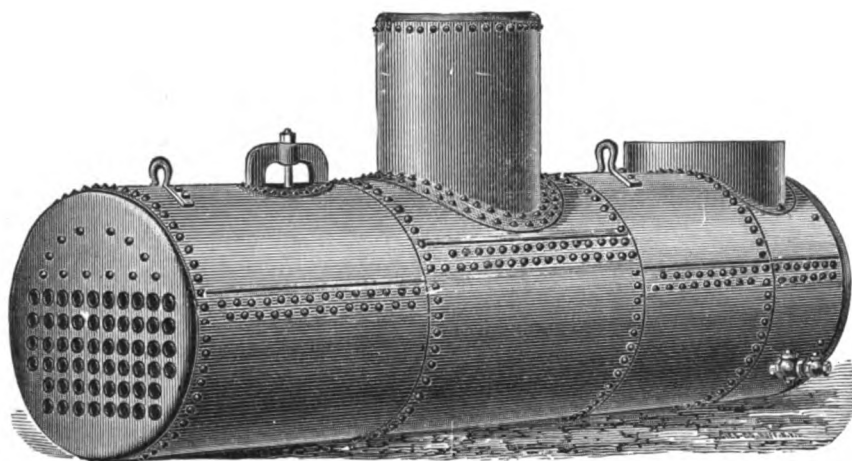


Plate 1360.

Our Standard Boilers of this style are made throughout of open hearth homogeneous flange steel plate. When a Boiler is ordered complete, as per list, we understand that a Standard Boiler of flange steel is wanted, with all fixtures and fittings as stated below.

To avoid all errors and misunderstandings, we give below full list of fixtures and fittings, all of which are sent when the order calls for "Boiler and fixtures complete."

These Boilers are all tested, inspected and insured before shipping.

Regular Boiler fixtures comprise half arch front with liners for Fire Brick, Grates, Grate Bearers, Boiler Stand, rear Arch Bars, Door and Frame for rear Ash Pit, Safety Valve, Steam Gauge, Water Gauge fitted with Stand Pipe, Gauge Cocks, Whistle and Pipe, Blow-Off Valve, Check Valve, Stop Valve, Smoke Stack, and Guys (four times the length of Stack).

Anything called for and not on this list will be charged as an extra.

Sawdust Grates will be substituted for regular Grates when ordered, without extra charge.

All Smoke Stacks up to and including 28 inches diameter are made of No. 16, and larger sizes of No. 14 Iron. If heavier Iron is required, a proportionate charge will be made.

The loops for hanging the Boiler, as shown in the cut, are not put on No. 7½ and smaller sizes, unless ordered.

No. 3½ and smaller sizes are without man-holes; all larger sizes have man-hole on top of shell.

STATIONARY TUBULAR BOILERS.

Number of Size	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518
Horse Power	10	12	15	20	25	30	35	40	44	48	48	50	54	60	70	80	90	100	125
Diameter of Boiler, inches	32	34	36	42	42	44	44	44	44	48	48	54	54	60	60	60	66	66	72
Thickness of Shell, inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Thickness of Heads, inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
Length of Tubes, feet	7	7	8	8	10	10	12	12	14	14	14	14	15	15	16	16	16	16	16
No. Tubes 3 inch Diameter	20	25	28	38	38	46	46	46	46	52	52	64	64	82	82	82	98	98	120
No. Tubes 3½ inch Diameter	16	20	22	30	30	36	36	36	36	42	42	50	50	64	64	64	78	78	94
No. Tubes 4 inch Diameter	13	16	18	25	25	30	30	30	30	34	34	42	42	54	54	54	64	64	78
Heating Surface, square feet	152	185	225	300	300	450	534	621	621	600	698	750	906	915	1,084	1,213	1,350	1,500	1,875
Diameter of Dome, inches	18	18	20	22	22	22	22	22	22	26	26	30	30	32	32	32	36	36	36
Height of Dome, inches	20	20	22	24	24	24	24	24	24	28	28	34	34	36	36	36	40	40	40
Length of Grate Bars, inches	36	36	36	44	44	44	48	48	48	48	54	48	54	48	54	54	54	54	54
Width of Grate Bars, inches	32	34	36	36	42	44	44	44	44	48	48	54	54	60	60	60	66	66	72
Diameter Smoke Stack, inches	14	16	16	20	20	22	22	22	22	22	22	26	26	28	28	28	30	30	34
Length Smoke Stack, feet	28	24	28	35	28	35	40	50	40	40	50	40	50	40	50	60	60	60	60
Wt. Boiler and Fittings, lbs.	1,900	2,300	2,600	3,500	4,100	4,400	5,100	5,700	6,000	6,800	7,400	7,400	8,700	9,000	10,000	11,100	12,900	13,600	16,500
Weight Boiler Fixtures, lbs.	1,400	1,500	1,600	1,900	2,100	2,400	2,600	2,800	3,100	3,300	3,600	3,600	3,900	4,200	4,600	4,900	5,300	5,500	6,400
Weight Boiler and Fixtures, lbs.	3,300	3,800	4,200	4,900	5,600	6,500	7,000	7,900	8,800	9,300	10,400	11,000	12,600	13,200	14,600	16,000	18,200	19,100	22,900
Additional Weight for Full Front Fixtures, lbs.	1,200	1,200	1,200	1,200	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,600	1,600	1,600	1,800	1,800	1,900

The above are our regular Boilers. We will gladly make proposals on any specifications and for any size or style Boiler wanted.

Write for prices, stating just what is wanted.

TWO-FLUE STATIONARY BOILERS.

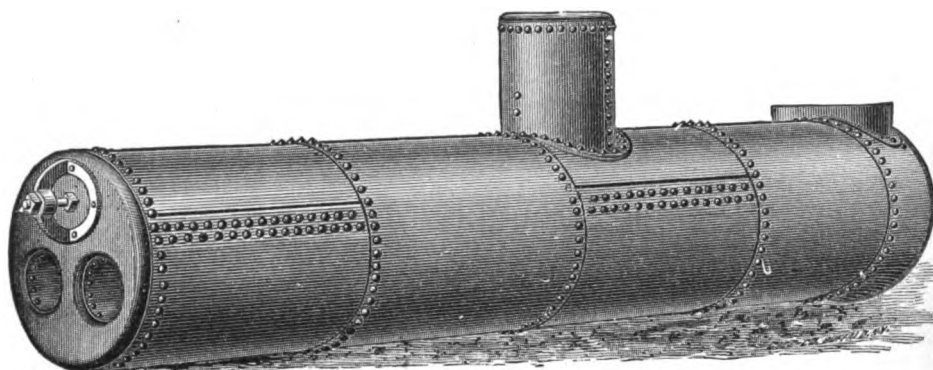


Plate 1361.

These Boilers are very carefully constructed and made in the best manner throughout. The longitudinal seams of the Shells are all double riveted, and the Domes on all Boilers 42 inches and larger, in diameter, are double riveted to the Shell; and the Heads and Domes are thoroughly braced in the most approved manner.

The Shells, Heads and Domes of our Standard Boilers, of the above style, are made throughout of open hearth homogeneous flange steel plate.

Small sizes have a Man-hole in Back-head above Flues; in larger sizes the Man-hole is in the Shell.

All the above Boilers will be made with Domes, unless otherwise ordered, and all Boilers may be made longer or shorter at a proportionate difference in price. In some of the smaller sizes of two-flue Boilers we use lap-welded iron flues of standard thickness.

Number of Size	531	532	532½	533	533½	534	535	536	537	538	538½	539	539½	540	541
Horse Power	10	12	13	15	18	20	25	30	35	40	42	45	47	50	53
Diameter of Shell, in.	30	30	32	32	32	36	40	42	44	48	48	48	48	50	50
Diameter of Flues, in.	10	10	10	11	10	12	13	14	15	16	18	16	18	17	18
Length of Flues, feet	10	12	12	13	14	16	18	20	22	24	24	27	26	28	28
Diameter of Dome, in.	18	18	15	18	15	20	20	22	22	26	28	26	28	26	30
Height of Dome, in.	20	20	15	20	15	22	22	24	24	28	28	28	28	28	30
Diameter of Stack, in.	16	16	16	16	16	18	20	20	22	24	26	24	26	26	26
Length of Stack, feet	30	30	30	30	30	40	50	50	50	50	40	50	50	50	50
Thickness of Shell, in.	¼	¼	¼	¼	¼	¼	9-32	9-32	9-32	5-16	5-16	5-16	5-16	5-16	5-16
Thickness of Flues, in.	3-16	3-16	3-16	7-32	7-32	¼	¼	9-32	9-32	5-16	5-16	5-16	5-16	5-16	5-16
Thickness of Heads, in.	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Weight, Boiler and Brichen, lbs.	2,100	2,350	2,450	2,700	2,900	3,650	4,700	5,800	7,300	9,200	9,700	10,100	10,000	10,900	11,000
Weight Fixtures, lbs.	1,800	1,800	2,050	1,950	2,100	2,350	2,950	3,000	3,150	3,650	3,650	3,650	3,650	4,100	4,100
Weight complete, lbs.	3,900	4,150	4,500	4,650	5,000	6,000	7,650	8,800	10,450	12,850	13,350	13,750	13,650	15,000	15,100

Boiler Fixtures comprise Half Arch Front with Liners for Fire Brick, Grates, Grate Bearers, Boiler Stand, Rear Arch Bars, Ash Door and Frame, Safety Valve, Steam Gauge, Water Gauge fitted with Stand Pipe, Gauge Cocks, Whistle and Pipe, Blow-off Valve, Check and Stop Valves, Smoke Stack and Guys (four times the length of Stack). Anything called for and not in this list will be charged as an extra.

Grates for all the above Boilers are 48 inches long and the width of the Grates in all cases equals the diameter of the Boiler. Sawdust Grates will be substituted for regular Grates, when ordered, without extra charge. Full Fronts, Wall Brackets, Wall Plates, and Rollers, Binding Bars and Rods, Stack Plate and Anchor Bolts are all subject to order, and are charged extra. All Smoke Stacks are made of No. 16 Iron; if heavier Iron is required, a proportionate charge will be made.

Write for prices, stating just what you need.

STEAM AND MUD DRUMS FOR STATIONARY BOILERS.

STEAM DRUM FOR TWO BOILERS.

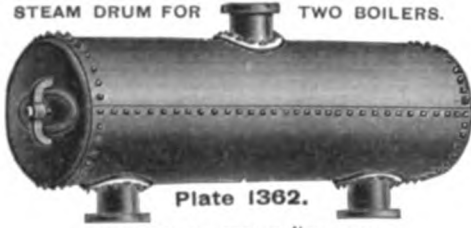


Plate 1362.

STYLE "A."



Plate 1363.

MUD DRUM, STYLE "C" FOR TWO BOILERS.



Plate 1364.

STYLE "B."

MUD DRUM FOR SINGLE BOILERS.

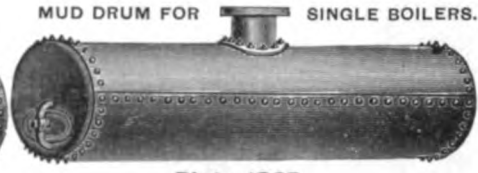


Plate 1365.

STEAM DRUMS—Connecting Two Boilers Set 6 Inches apart.

Diameter of Boiler, inches	26 to 30	32 to 36	38 to 44	48 to 50	54	58 to 60	66	72	78 to 84
Diameter of Steam Drum, inches	18	18	20	22	24	28	30	34	34
Length of Steam Drum, feet	5	5½	6	7	7	7½	8	8½	10
Weight, lbs. about	675	700	800	960	1,000	1,200	1,350	1,550	1,700
For Two Boilers	\$85 00	\$85 00	\$90 00	\$95 00	\$100 00	\$120 00	\$140 00	\$145 00	\$150 00
For each additional Boiler	35 00	40 00	45 00	45 00	50 00	55 00	60 00	70 00	85 00

Shells of Steam Drums are ¼ inch; Heads, ¾ inch thick; Hand-Hole in each end, and steam outlet on top.

MUD DRUMS.

Diameter of Boiler, inches	26 to 30	32 to 36	38 to 42	44	48 & 50	54	58 & 60	66	72	78 to 84
Diameter of Mud Drum, inches	12	12	14	14	14	14	16	16	16	16
Length of Mud Drum "A," feet	4½	4½	5	5	5	5	5½	5½	5½	6
Length of Mud Drum "B," feet	5	5½	6	6	7½	7½	9	9	10	10½
Length "C" (Boilers 6 in. apart) ft.	8	9	10	11	12	13	14	15	16	18
Weight Mud Drum "A," lbs. about	350	350	450	450	450	450	500	550	550	600
Weight Mud Drum "B," lbs. about	375	400	500	500	600	600	750	800	800	850
Wt. Mud Drum 2 Boilers lbs. about	600	650	800	850	900	950	1,150	1,200	1,250	1,350
Mud Drum A	\$50 00	\$50 00	\$55 00	\$55 00	\$55 00	\$55 00	\$65 00	\$65 00	\$65 00	\$68 00
Mud Drum B	53 00	55 00	60 00	60 00	65 00	65 00	80 00	80 00	80 00	98 00
Mud Drum C	85 00	90 00	95 00	100 00	110 00	115 00	120 00	130 00	135 00	140 00

Shells of Mud Drums from ¼ to 5-16 inch, heads ¾ inch thick. Hand-Hole in back end of Mud Drum "A," and in each end of all other Mud Drums. Cast iron connections between Drums and Boilers, with necessary Bolts and Gaskets, will be sent, unless wrought are specified in order, in which case we will rivet in connection to Drum, and furnish rivets for attaching Drum to Boiler, to be driven at purchaser's expense, after Boilers are placed in position.

If extra lengths are wanted a proportionate charge will be made.

Diameter of Stack	SMOKE STACKS										EXTRAS		
	Made of No. 16 Iron		Made of No. 14 Iron		Made of No. 12 Iron		Made of No. 10 Iron		Made of No. 8 Iron		Made of 3-16 Thick Iron		Stack Plate
	Price, per Foot	Weight, per Ft. Lbs. about	Price, per Foot	Weight, per Ft. Lbs. about	Price, per Foot	Weight, per Ft. Lbs. about	Price, per Foot	Weight, per Ft. Lbs. about	Price, per Foot	Weight, per Ft. Lbs. about	Price, per Foot	Weight, per Ft. Lbs. about	
10	\$0 55	7½	\$0 60	9½	\$0 80	14	\$0 95	15½					\$ 4 00
12	60	9	70	11½	90	16	1 05	18½					4 00
14	65	10½	75	13½	95	18	1 15	21½					4 00
16	70	12	80	15½	1 05	20	1 25	24½					5 00
18	75	13½	90	17½	1 15	22½	1 40	28					5 00
20	80	15	95	19	1 25	25	1 50	31					5 00
22	90	16½	1 05	21	1 40	27½	1 65	34					6 00
24	1 00	17½	1 15	22½	1 55	29½	1 75	37					6 00
26	1 10	19	1 25	24	1 65	32	1 90	40					6 00
28	1 20	20½	1 35	26	1 75	34½	2 00	43					7 00
30	1 25	22	1 45	28	1 90	36½	2 15	46	\$ 3 30	56	\$ 4 00	60	8 00
32	1 35	23	1 55	29½	2 00	39	2 25	49	3 60	59½	4 30	64	9 00
34	1 45	24	1 65	31	2 15	41	2 40	52	3 90	63	4 65	68	10 00
36	1 55	25	1 75	32½	2 30	43½	2 55	55	4 20	66½	5 00	72	10 00
38			1 90	34	2 45	45	2 70	58	4 50	70	5 25	76	11 00
40			2 00	35½	2 60	47	2 85	61	4 65	73½	5 55	80	13 00
42			2 15	37	2 75	49½	3 00	64	4 85	77	5 80	84	14 00
44			2 30	39	2 90	52	3 20	67	5 15	80½	6 10	88	18 00
46			2 50	41	3 00	54½	3 40	70	5 40	84	6 40	92	19 00
48			2 70	45	3 15	56½	3 60	73	5 55	87	6 65	96	21 00
50					3 30	59	3 80	76	5 70	90½	6 80	100	23 00
52					3 45	61½	4 00	79	5 95	94	7 00	104	28 00
54					3 60	64	4 15	82	6 10	97½	7 20	108	29 00
56					3 75	66½	4 35	85	6 30	101	7 50	112	30 00
58					3 90	69	4 55	88	6 55	104	7 80	116	33 00
60					4 00	71½	4 75	91	6 80	107½	8 10	120	38 00
62									7 00	111	8 35	124	
64									7 25	114½	8 65	128	
66									7 45	118	8 95	132	
72									8 25	121½	9 75	144	
78									8 85	125	10 55	156	
84									9 60	128½	11 25	168	
90									10 25	132	11 95	180	
96									11 00	135½	13 05	205	

NOTE.—For Elbows in Stack add cost of 8 Feet of Stack. Iron Ladder Riveted to Stack, 75 cents per foot.

THE LAKE PORTABLE KEY-SEATER.

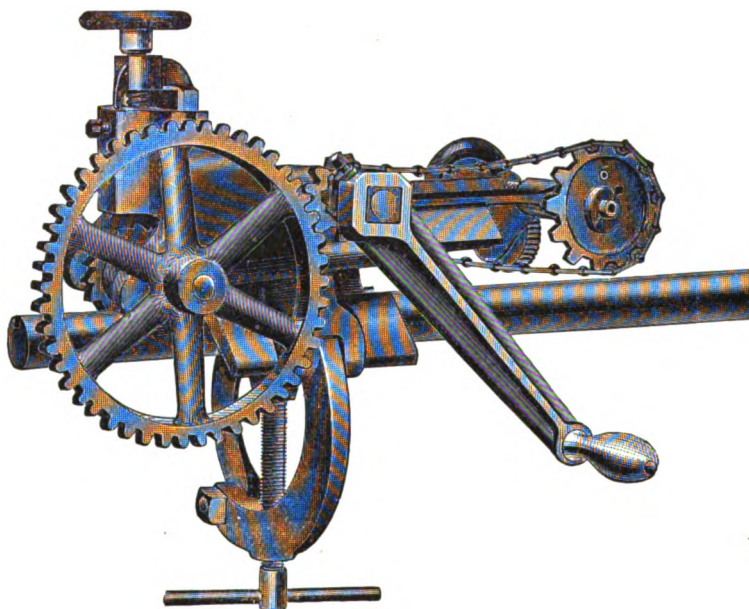


Plate 1366.

The above cut shows the machine mounted on a small size shaft. It represents the machine as it appears after having cut a key-way four inches from the end of shaft.

This machine will mill key-seats any length in shafting from $1\frac{1}{4}$ inches to $4\frac{3}{4}$ inches in diameter, and the following widths: $\frac{1}{4}$, 5-16, $\frac{3}{8}$, 7-16, $\frac{1}{2}$, 9-16, $\frac{5}{8}$, 11-16, $\frac{3}{4}$, 13-16, $\frac{7}{8}$, 15-16, 1, 1 $\frac{1}{16}$, and $1\frac{1}{8}$ inches, and any depth not exceeding $\frac{5}{8}$ inch. Each machine is furnished with six milling cutters, which, by placing one or more on the spindle of the machine, key-seats the sizes mentioned above, can be cut at one operation the width required.

The machine is provided with either automatic or hand feed while cutting, and has a dial to show the depth cut in the shaft. The machine will mill 4 inches before it is necessary to move the base forward on the shaft. An operator can easily cut a key-seat 12 inches long, $\frac{5}{8}$ inch wide, 5-16 inch deep, in one hour, and other sizes in proportion.

The advantages of the machine will be apparent to all machinists, millwrights and superintendents of mills where shafting is used. No millwright or machinist doing erecting or repair work can afford to be without this machine. In making repairs in mills, etc., it is a very serious thing to be compelled to take down a line shaft, or any part of it, to have a key-seat cut, or if not removed from its position it is necessary to chisel the same, which is a very slow operation, and not very satisfactory when completed.

With this machine it is not necessary to remove shafting from its hangers or boxes to cut a key-seat, and in this way a split pulley or coupling can be applied very quickly, or if a solid pulley is used, it is only necessary to remove hanger or box, so as to slide the pulley on the shaft, thus saving time, which amounts to a great deal where any number of persons are employed.

Price of machine with cutters, F. O. B. cars, St. Louis, \$50.00. Will ship by freight unless otherwise ordered. Weight of machine, 45 pounds.

CUTTERS FOR THE LAKE PORTABLE KEY-SEATER.

$\frac{1}{4}$ inch wide, net	\$1 40
5-16 inch wide, net	1 50
$\frac{3}{8}$ inch wide, net	1 60
7-16 inch wide, net	1 70
$\frac{1}{2}$ inch wide, net	1 80

Keep your cutters sharp. Cutters sent post-paid by mail on receipt of price. We keep machines and cutters in stock and can ship on receipt of order. Your order is solicited.

DIRECTIONS FOR OPERATING.

The cutters should be placed on the spindle so as to cut toward the base of the machine, or that portion clamped to the shaft. The handle must always be turned to the right, the operator being in front of the machine facing the dial.

Keep the cutters sharp and all ground to the same diameter. Keep all working parts of the machine well oiled including the milling cutters.

The base of the machine being clamped to the shaft, that portion carrying the cutters is pulled toward the operator, to the position where it is desired to start the key-seat, and locked in that position by means of the lever operated in slot in the base, the bolt for driving sprocket wheel being disengaged the cutter can be fed downward to the depth desired by means of the hand wheel.

Now by engaging the bolt for driving the sprocket wheel, the key-way can be cut until it is necessary to move the base forward to continue the key-way to the length required.

When the cutters are kept sharp the machine will mill all key-seats up to $\frac{3}{4}$ inch wide, by $\frac{5}{8}$ inch deep at one operation, but for the wider key-seats it will be necessary to go over the work two or more times, according to the depth required.

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